

**DOCUMENT MASTER LIST TEMPLATE FOR <PROJECT/PRODUCT-DEPARMENT>**

**Software Process And Quality Management**

**Team 5 K16T1**



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# INTRODUCTION

***Guidance***

*Configuration Management (CM) is the process used during system development and maintenance to identify, control, and report functional and physical configurations of system and software engineering products (e.g., hardware, system architectural design(s), interfacing equipment/systems, drawings, source code, executable code, databases, test scenarios and data, and documentation). Use this template to ensure that the project CM Plan (CMP) identifies all of the activities associated with CM identification, control, status reporting and audit.*

## PURPOSE

This Configuration Management (CM) Plan (CMP) describes the CM organization and practices applied consistently and uniformly throughout the life cycle for Configuration Items (CIs) that are developed or maintained by *[[originating organization]].*

The purpose of this document is to define and document CM activities, requirements, and resources to control the development and modification of the [[Project Title]] system.

## SCOPE

This plan establishes the CM methods used during the development and maintenance of the *[[Project Title]]* system.

## APPROACH

The CM discipline is applied to those CIs for which the project organization has development and/or maintenance responsibilities. The CM organization implements the activities described within this plan to ensure that products developed are correct, consistent, complete, and compliant with organization policies.

***Guidance***

*When project management authorizes a separate configuration management plan for facilities, user this CMP as a template*

## SYSTEM OVERVIEW

***Guidance***

*Provide a brief description of the system to which this plan applies*

## PROJECT-DEFINED CONFIGURATION ITEMS

***Guidance***

*If the number of CIs covered by this Plan exceeds ten items, or if it is likely that the number or configuration of CIs will change periodically, it is recommended that the following table and supporting text be placed as an Appendix to this Plan. Section 6 describes the products and associated technical data that should be considered for CI identification.*

Table 1-1 shows the CIs to which this plan applies.

Table 1-1: CI Nomenclature/Identification

|  |  |  |  |
| --- | --- | --- | --- |
| NOMENCLATURE | ACRONYM | CI NUMBER | RESPONSIBLE CUSTODIAN |
| [[CI#1]] | *Acronym* | *CI Identification (ID) number* | *Custodian organization name and code* |
| [[CI#2]] | *Acronym* | *CI ID number* | *Custodian organization name and code* |
| [[CI#3]] | *Acronym* | *CI ID number* | *Custodian organization name and code* |

Listed below is a brief description of each of the CIs developed and maintained by [[originating organization]].

* [[CI #1]] - *Include a brief description of the CI and its purpose*.
* [[CI #2]] - *Include a brief description of the CI and its purpose.*
* [[CI #3]] - *Include a brief description of the CI and its purpose.*

The [[Project Title]] system includes important subordinate segments or subsystems within the system. Figure 1-1 identifies the CIs within each segment and highlights those to which this CMP applies. The current [[Project Title]] Project Management Plan (PMP), reference 2.1.2a, contains a detailed description of the system.

***Guidance***

*Cite the appropriate project management document: e.g., Project Management Plan (PMP), Software Development Plan (SDP), or other appropriate document that describes the project’s organization, responsibilities, and activities.*

## DOCUMENT OVERVIEW

This CMP establishes the plan for the configuration management of systems, hardware, software and related documents produced by the [[project organization]]. The procedures developed in this CMP are applicable to all personnel responsible for the analysis, design, development, maintenance, and testing of hardware and/or software embedded in or impacting on the operational capabilities of [[Project Title]]. This document is organized into the sections listed below and prepared in accordance with the CMP This plan provides the following sections:

* **Section 1 -** provides the scope, the purpose, and a summary of the contents of the CMP and a list of common configuration management terms and definitions.
* **Section 2 -** lists the standards and other publications referenced in this document and used in its preparation.
* **Section 3 -** outlines the project organization and responsibilities.
* **Section 4 -** describes the CM phasing and milestones.
* **Section 5 -** describes the activities associated with DM.
* **Section 6 -** describes the process of configuration identification of CIs, associated technical documentation, code, and media.
* **Section 7 -** describes the approach for identification and maintenance of system interfaces.
* **Section 8 -** describes the process for maintaining configuration control of CIs and their associated technical data.
* **Section 9 -** describes the Configuration Status Accounting (CSA) process used to record and report CI information.
* **Section 10 -** describes the approach used for performing physical and functional configuration audits, and for obtaining internal and external reviews of CM procedures, activities and products.
* **Section 11 -** describes the methods used to ensure subcontractor and vendor compliance with CM requirements.
* **Section 12 -** describes the requirements for review of CM activities with higher-level management.
* **Section 13 –** describes the collection of process improvement data that is the basis for future changes to the CM process and activities.
* **Appendix A** - contains a list of all acronyms and abbreviations and their definitions used in this document.
* **Appendix B** - contains the format and preparation instructions for forms used by the CM organization.
* **Appendix C** – contains the schedule of planned CM activities.
* ***Guidance***
* *Appendix C is included if CM activities are not specified in a separate Project Activity Schedule that is typically included in the PMP.*

Figure 1 provides an overview of the CM activities described in this Plan. In the figure, Data Management (DM) is shown connected to CM with a broken line. DM is a sub-function of CM with CM having overall cognizant responsibility. Quality Assurance (QA) is a separate function that works closely with CM to ensure the integrity of the product (i.e., CM controls the product; QA certifies the integrity of the product). The QA function is described in ***cite the applicable document.***

***Guidance***

*The number of CIs and associated documents placed under CM determines if the CM organization will be separate from the DM function. Where established, DM provides a separate function for receiving, controlling, distributing and maintaining an organization’s documentation and its supporting storage media (recordable disk/CD/DVD, data base retrieval systems, etc.*

## CM TERMS AND DEFINITIONS

***Guidance***

*The terms and definitions listed in Appendix A are provided as an aid to understanding and applying the CM principles and procedures used to manage product development and testing efforts. The terms and definitions are compiled from guiding directives.*

Appendix A lists acronyms, abbreviations and definitions appropriate to the *[[Project Title]].*

**Identification** Refer to Section 6

• Assign a unique designator to project identified CIs and technical data that includes identification of the associated baselines.

• Verify project identification for CIs and technical data.

• Assign tracking numbers to change requests.

• Establish libraries for software, drawings, documents, and development tools.

CM

*Refer to Sections 6, 8, 9 and 10*

•Identification

• Control

• Status Accounting

• Reviews/Audits

**Control**  Refer to Section 8

• Receive and place CI and technical data in the libraries, thereby providing physical control.

• Process CI/technical data requests.

• Provide change request data.

• Deliver product releases from controlled CIs and technical data, including associated changes to authorized baselines thus ensuring data integrity.

DM

Refer to Section 5

• Receipt

• Control

• Compliance

• Tracking

• Distribution

**Status Accounting** Refer to Section 9

• Receive CI and technical data for entry into the CSA system (i.e. data entry)

• Generate CSA reports including metrics and schedule data.

QA

(Refer to Project QA Plan or Project Mgmt Plan)

• Verification & Validation

• Monitor

• Audit

• Evaluate

• Certify

**Reviews/Audits** Refer to Section 10

• Support QA requests for technical data and CI and associated data.

• Perform informal reviews of CM tasks, desktop procedures, and CSA reports.

**Figure 1-1: Overview of CM activities**

# REFERENCED DOCUMENTS

This section lists the specifications, standards, manuals, and other documents, including policy directives, referenced or used as source material for this plan.

***Guidance***

*Delete or add applicable documents. The referenced documents are placed here as suggested documents that the project may wish to refer to as supporting documents for their CMP.*

* Configuration Management Plan Template for Systems and Software Engineering
* Risk Management Process
* Software Development and Documentation
* Configuration Management Guidance
* Information Security Program Regulations
* Configuration Management
* Project Management Plan Template
* System Engineering Management Plan
* Technical Reviews and Audits for Systems, Equipment, and Computer Software
* Configuration Management Data Interface
* Configuration Management Policy
* Configuration Management Process
* Software Life Cycle Processes
* Capability Maturity Model Integration for Systems Engineering/Software Engineering/Integrated Product and Process Development, and Supplier Sourcing

# MANAGEMENT

This section describes the CM organization in relation to the program and project organization structure, and describes the planning, resources, and training necessary to implement CM.

## ORGANIZATION

Figure 3-1 is a graphic representation of the program and project organizational structure with respect to the CM organization. Although CM takes direction from the Project Manager, it operates within the policies and procedures established by ***name of the organization establishing policies***.



**Figure 3-1: Organization Structure**

***Guidance***

*Depending on the size of the organization, the functional groups defined below may be combined (e.g., the Systems Engineering and the Design and Development Group may be one group known as Product Development). You will need to define the group interfacing with the CM organization. Ensure that the description is an accurate portrayal of the contractual obligations of the organizational groups listed*.

CM interfaces with the groups listed below to control product configuration and release activities:

* **Program Management (Code Number) -** Responsible for and has the authority to ensure complete fulfillment of all program requirements. The Program Manager has the overall responsibility for acquisition, funding, and transitioning of the project. The Program Manager establishes the goals and objectives for CM performance.
* **Project Management (Code Number) -** Responsible for the technical aspects of the project. The Project Manager has the responsibility for local funding, allocations, scheduling, tasking, and reporting to program management. Project Management ensures that the CM Process is established and the CM Group created, and that the CM activities are successfully accomplished.
* **Systems Engineering (Code Number)**  - Responsible for hardware systems development (and associated documentation) overview and guidance; detailed design and engineering; test plans, procedures, and reports; hardware unit testing; and preliminary Hardware Configuration Item (HWCI) testing. Systems Engineering develops the Hardware Configuration Items and supporting materials provided to CM for identification and control.
* **Software Engineering (Code Number) -** Responsible for software development (and associated documentation) overview and guidance; detailed design and coding; test plans, procedures, and reports; software unit testing; and preliminary CI testing. Software Engineering develops the Software Configuration Items and supporting materials provided to CM for identification and control.
* **Design and Development (Code Number) -** Responsible for software/system architectural design (and associated documentation); detailed design and coding; test plans, procedures, and reports; software/hardware unit testing; and preliminary CI testing. Design and Development provides the resulting products to CM for identification and control.
* **Software Test (Code Number) -** Responsible for the conduct of software testing, including preparation of test plan, description, procedures, and reports. The Software Test Group ensures that the correct configuration is undergoing test and incorporates approved changes into released test documentation based on change request baselining data from CM. The Software Test Group confirms verification of change request corrective measures prior to change request closure. CM identifies all change requests included in the baselined Configuration Item that are tested. Test personnel then provide CM a copy of the test report.
* **System Test (Code Number) -** Responsible for administering the testing of hardware, integration testing of hardware and software, and overall system verification and validation (V&V) testing prior to release of the product. The System Test Group is a separate organization from the Design and Development Group. CM identifies all change requests included in the baselined Configuration Item that are tested. Test personnel then provide CM a copy of the test report.
* **Logistics (Code Number) -** Responsible for ensuring that changes made to a system are supportable. CM provides CI and associated technical data for logistics evaluation.
* **Data Management (DM) (Code Number) -** Responsible for the receipt, distribution, and tracking of technical data associated with the project. DM also ensures compliance with contract requirements as defined in the Contract Data Requirements List (CDRL).
* **Quality Assurance (QA) (Code Number) -** Responsible for auditing the development activities and products (Functional and Physical Configuration Audit, FCA and PCA) and certifying of CM compliance with this plan and supporting procedures.

***Guidance***

*If the list of groups exceeds the list above, it may be appropriate to create numbered paragraph headings for each group.*

### **3.1.1 CM ACTIVITIES**

CM includes maintaining configuration control over systems, software, developmental CIs and baselines, and processing changes to their configuration. This is accomplished by performing CM planning and management, configuration identification, configuration control, CSA and configuration audits. In addition, CM is responsible for training project personnel on their roles and responsibilities in support of CM activities for the project, and for providing improvement suggestions and lessons learned on the project’s defined CM Process to the project manager or other appropriate group.

The responsibilities of each CM activity are listed in the sections below.

***Guidance***

*Tailor these responsibilities to be project specific. Section 3.1.1.1 may be addressed in the project planning documents*

* **CM Planning and Management.** CM Planning and Management responsibilities are listed below:
* Ensure that the appropriate procedures are planned and implemented.
* Establish responsibilities for accomplishing CM activities.
* Determine and acquire necessary resources and facilities.
* Provide continuous review and improvement of the CM Process.
* Report to higher-level management on the status of ongoing CM activities.
* Resolve any discrepancies or issues relating to the accomplishment of CM activities.
* **Configuration Identification.** Configuration Identification responsibilities are listed below:
* Establish methods and procedures for unique identification of CIs.
* Coordinate assignment of identifying numbers for CIs and documents.
* Establish and maintain Functional, Allocated and Product Baselines, and the Developmental Configurations (identify, document, archive, and track changes to system releases).
* Establish and follow release procedures to obtain Product Baselines for new version releases.
* Provide documentation that reflects the release hardware and/or software package.
* Coordinate release of hardware, software and associated documentation to release organizations.
* Maintain records and prepare reports on release coordination activities.
* **Configuration Control.** Configuration Control responsibilities are listed below:
* Establish and use configuration controls for software, hardware and documentation.
* Establish and document configuration change control procedures.
* Serve as a member of the Configuration Control Board (CCB). CM is responsible for preparing and distributing the meeting agenda and minutes, and for recording action items and their resolution.

***Guidance***

*If the CM Group assists the Design and Development Group with maintaining CM control of Development Configurations, describe this here.*

* Place contents of Baselines and Developmental Configurations under configuration control.
* When appropriate, generate executable load modules from controlled source code.

***Guidance***

*Describe the CM repositories supported by the CM Group. If the project is hardware-development focused, that archive is typically described as Engineering Notebooks. If the project is software-development focused, that archive is typically described as a Software Development Library (SDL). Use the nomenclature that is appropriate to the project.*

* Ensure that the contents of the Software Development Library (SDL) and/or Engineering Notebooks are changed by CM personnel, and only upon receipt of the appropriate paperwork signed by the CM Manager.
* Prepare and maintain master(s) of the currently active version of each CI until superseded by a new version. Retain superseded versions of the master(s) in the SDL archive files.
* Maintain records and prepare reports on SDL activities and software products.
* Perform non-technical checks of software and/or hardware documentation.
* Interface with Change Review Board (CRB) Chairperson to schedule CRB meetings, prepare CRB agendas, and record CRB meeting minutes.
* Configuration Status Accounting. Support of CSA includes the items listed below:
* Provide CSA recording and reporting.
* Maintain an accounting of configuration item changes by tracking change requests, ensuring traceability to a ***formal Engineering Change Proposal (ECP)*** from initiation through resolution and disposition.
* Prepare status reports on change requests, ***ECPs***, and changes.
* **Configuration Audits**. Configuration Audit responsibilities are listed below:
* Support requests for audit and certification of systems by QA or the independent auditor.
* Perform reviews of CM activities and products.
* Review and update CM documentation as required to ensure that current applicability is maintained.

***Guidance***

*Tailor the following section to list specifics of project CM training. Tailor the contents of Table 3-1 below to reflect the project’s requirements.*

* **Training**. The CM Manager is responsible for identifying, establishing, coordinating, and revising training, as required, to ensure effective performance of CM activities by the CM organization and project groups.

Table 3-2 provides a matrix that identifies the required skills to perform CM tasks to implement this [[Project Title]] CM Plan. The training schedule will be compatible with the project schedule. In some cases, training will be conducted as On-the-Job (OJT) training.

Table 3-1: CM Training Matrix

|  |  |  |  |
| --- | --- | --- | --- |
| **TASK** | **SKILL REQUIREMENTS** | **TYPE** | **SOURCE** |
| CM Techniques | CM process research, development and implementation | Classroom/ OJT | MIL-HDBK-61A, EIA-649, Systems Engineering Process Office (SEPO), CM Practitioner's Training |
| CM Audits | CM processes, audit techniques | Classroom/ OJT | CMP, SEPO, CM Practitioner’s Training |
| Testing | Testing methodologies | OJT |  |
| QA Management | Project management | Classroom/ OJT | SEPO, Project Management Core Course (PMCC) |
| Metrics | Data collection and analysis | Classroom/ OJT | SEPO, PMCC |
| Problem reporting and correction action | Configuration management | Classroom/ OJT | SEPO, CM Practitioner's Training |
| Tools | Vendor supplied training | Classroom/ OJT | Vendor |
| Code, Media, and Supplier Control | Configuration management | Classroom/ OJT | SEPO, CM Practitioner's Training |
| Risk Management and Analysis |  | Classroom/ OJT | SEPO, PMCC, Risk Management Process |

## BOARDS

***Guidance***

*Identify the configuration control board(s) established for the project and program organization, e.g., CRB, CCB, or Local CCB (LCCB). Reference any charters, Memoranda of Understanding, or any program directives that establish the CCBs. Ensure that the correct nomenclature for the board(s) is (are) used, as the project may interface with higher and lower-level agency control boards. If the project’s sponsor has documented program-level control boards in its program-level CMP, reference that document, rather than describing them in Section 3.2.1 below. Details concerning the responsibilities and activities of these boards should be described in Section 8, Configuration Control.*

*The sections below provide an overview of the functions, responsibilities, and authority of the CCBs.*

### **CHANGE REVIEW BOARD**

***Guidance***

*Some Program Offices establish a program-level CCB, vice naming a CRB, with project-level control boards identified as Local CCBs. Use this nomenclature if it is appropriate. If no higher-level board exists for this project, tailor out this paragraph.*

The CRB functions in a technical advisory capacity to the Program Manager. The CRB considers the recommendations of the project’s CCB for final approval or disapproval of proposed engineering changes to a CI's current approved configuration and its documentation. The board also approves or disapproves proposed deviations. Section 8 of this CMP describes the detailed change control functions of the CRB.

CM provides status accounting reports to the program’s CRB and updates the status accounting database to reflect CRB decisions. ***CM or designate*** serves as secretariat to the board.

### **CONFIGURATION CONTROL BOARD**

***Guidance***

*Change control responsibility may be delegated between the program sponsor, who may coordinate the configuration control of related projects, and LCCBs, who manage changes at the specific project CI level. If this is the case, include descriptions of the LCCBs and the scope of their responsibility, and include the LCCBs in the organization description in the CMP.*

The CCB supports the Project Manager and includes technical and administrative representatives who recommend approval or disapproval of proposed engineering changes to a CI's current approved configuration and its documentation. The board also recommends approval or disapproval of proposed deviations from a CI's current approved configuration and its documentation.

Issues that the project-level CCB are unable to resolve or that involve a change in scheduling or fiscal costs are initially addressed by the CCB and forwarded to the program’s CRB for final approval or disapproval and recommendations. Section 8 of this CMP describes the detailed change control functions of the CCB.

CM provides status accounting reports to the project-level CCB and updates the status accounting database to reflect CCB decisions. ***CM or designate*** serves as secretariat to the board.

## RESOURCES

***Guidance***

*The CM Manager schedules CM activities to coordinate with project life cycle activities. The project PMP, if developed, may provide a master schedule of product development and maintenance activities that includes CM participation. If so, reference that PMP schedule in the following paragraph. If not, see the next guidance block below.*

### **PLANS, SCHEDULE, AND BUDGET**

The CM Manager, working with the PM, plans CM activities for the [[Project Title]]. The CM Manager documents scheduled CM. The CM schedule is closely coordinated with the product. Informal CM audits will be performed at the conclusion of each new phase of development to verify that the CM procedures are correctly implemented as defined in this document. Formal CM audits will be scheduled as dictated by ***cite the appropriate document***.

With the PM, the CM Manager establishes budget requirements necessary to accomplish the tasking specified in this plan. The estimated CM budget for this project is ***identify the document.*** The CM Manager will periodically review actual budget expenditures against planned expenditures and coordinate with the PM to resolve any issues.

***Guidance***

*If there is no higher-level document that provides a schedule of CM activities, include the following paragraph and Appendix that provide a documented schedule of CM activities.*

The planned schedule of CM activities is documented in Appendix C. The CM Manager coordinates with the PM to ensure that CM activities are conducted in concert with the appropriate project activities.

### **FACILITIES**

To accomplish tasking in accordance with this plan, the CM Group requires ***list the facilities, physical plan, equipment, and computer hardware/software requirements***.

### **PERSONNEL**

The CM effort for this project is ***person-year effort or indicate the amount of effort if it is less than 100% - ensure the effort agrees with the project Work Breakdown Structure.***

***Guidance***

*Identify the qualification requirements of the CM Group. The product for which related technical discipline familiarity is required should be explicitly stated, e.g., hardware/software/systems engineering, and technical documentation standards.*

The CM Group will be familiar with and will be able to apply the standards and guidelines listed in Section 2. Additionally, the CM Group will be familiar with software and hardware configuration management, product and process quality assurance, product development-related activities, and ***statistical analysis, C++ and Java coding, and testing [tailor this list as appropriate]***.

### **CM SYSTEM**

***Guidance***

*Describe the Configuration Management System (CMS) employed to support CM activities. A CMS includes the storage media, procedures and tools for accessing the configuration system. A CMS may be manual (consisting of controlled ledgers, notebooks, spreadsheets, or similar items) or automated (comprising a computerized database or similar set of tools and capabilities) or be a combination of the two. The detailed description of the procedures supporting the CMS may be separately documented as individual CM procedures and should be referenced (e.g., procedures for storage and retrieval of CIs, archiving and retrieving CM records, creating CM reports).*

## RISK MANAGEMENT

***Guidance***

*Identify the risk management strategy for CM. If the project has identified an overall risk management strategy in its PMP, or as a separate Risk Management Plan, reference that document. If the CMP is written as a stand-alone document, describe the Risk Management activities for the project including the items listed below:*

* *The identified CM risks, with estimates of probability and impact to the project’s schedule and cost.*
* *The person(s) responsible for managing CM risks.*
* *The criteria (e.g., risk threshold and conditions) necessary to commence risk management activities.*
* *The risk mitigation strategies for each risk.*
* *Etc.*

### 

# CM PHASING AND MILESTONES

***Guidance***

*The author may choose to describe this section of the document using a combination of text and graphics, text only, or graphics only.* *Section 4 should be tailored to describe CM activities within the system development life cycles described. The sample text in this section describes project activities as specified in Systems Engineering –*. *The project CM, working with the PM, identifies the appropriate levels of CM control that will be reflected in the phasing of CM activities throughout the product life cycle in this section.*

This section describes [[Project Title]] activities specified by ***defining standard,*** for project groups and the corresponding CM activities in relation to the activity and program events. The purpose of this section is to ensure that CM activity is appropriate to the scope and timing of the project activity.

## PROJECT CONCEPT PHASE

***Guidance***

*Individual projects must tailor this section to describe project activities derived from applicable standards and phasing consistent with the project's management plan.*

* The objective of the Concept phase is to explore various material alternatives to satisfying the documented mission need.

CM activities are listed below:

## PROJECT DEVELOPMENT PHASE

***Guidance***

*Individual projects must tailor this section to describe project activities derived from applicable standards and phasing consistent. Table 4-1 below suggests a graphic method for illustrating CM activities within a project life cycle phase. The activities listed here are derived from the development phase as described in Software Life Cycle Processes, but should be tailored to reflect the guidelines the project is following.*

Table 4-1 defines the CM milestones in relation to project activity for *[[Project Title]].*

Table 4-1: CM Milestones

|  |  |
| --- | --- |
| **SYSTEM DEVELOPMENT ACTIVITY** | **CM MILESTONE** |
| System Requirements Analysis | System requirements documents under configuration control  Project review, CCB and CRB support |
| System Architectural Design | Approved CMP implemented  CM tasks identified  CM procedures created and/or maintained  System design documents baselined and maintained  Functional Baseline established and maintained  CSA system established and maintained  CM Document Library established and maintained |
| Software Requirements Analysis | Requirements documents baselined  Allocated Baseline established  CM Drawing Library established and maintained |
| Requirements Review | Changes to requirements are reviewed, approved and baselined  CSA Records updated |
| Software Architectural Design | Development Configuration products maintained  Development Configuration corrective action process established |
| Software Detailed Design | Design documents baselined  Test requirements recorded |
| Design Review | Changes to design documents are reviewed, approved and baselined  CSA Records updated |
| System/Software Test Readiness Review | Project Documents (e.g., requirements, specifications, test plans, traceability matrices) provided by CM for review  Changes to project documents resulting from review are recorded and baselined  CSA Records updated |
| Software Coding and Testing | CSA Records updated |
| Software Integration | CSA Records updated |
| Software Qualification Testing | Test documents baselined |
| System Integration | FCA and PCA support |
| System Qualification Testing | Test reports recorded |
| Software Installation | Product Baseline established and maintained  System user documents and manuals baselined |
| Software Acceptance Support | Product Baseline archived  Product Baseline transferred to Software Support Activity (SSA) |

### **SYSTEM REQUIREMENTS ANALYSIS**

During system requirements analysis, project groups participate in the definition and documentation of system requirements and methods used to ensure that each requirement has been met.

CM activities are listed below:

* Participate in joint management and project reviews to provide status on CM activities.
* Place system requirements documents (e.g., Operational Concept Description (OCD), System/Subsystem Specification (SSS), Interface Requirements Specification (IRS)) under configuration control.
* Support the CCB and CRB.

### **SYSTEM ARCHITECTURAL DESIGN**

During system architectural design, project groups participate in the definition and documentation of system-wide design decisions.

CM activities are listed below:

* Implement the approved CMP.
* Create or update CM procedures.
* Participate in joint management and technical reviews.
* Place system design documents (e.g., System/Subsystem Design Document (SSDD), Interface Design Document (IDD), Data Base Design Document (DBDD)) under configuration control.
* Maintain configuration control of the Functional Baseline.
* Support the CCB and CRB.
* Establish and maintain the CSA system.
* Provide access procedures to project personnel on use of the CSA system.
* Generate and distribute CSA reports.
* Establish and maintain the CM Document Library.

### **SOFTWARE REQUIREMENTS ANALYSIS**

During software requirements analysis, project groups participate in the definition and documentation of CI software requirements in the project Software Requirements Specification (SRS) or the IRS.

CM activities are listed below:

* Place software requirements documents (SRS, IRS) under configuration control
* Maintain configuration control of the Functional and Allocated Baselines
* Participate in joint management and technical reviews
* Support the CCB and CRB
* Maintain the CSA system
* Generate and distribute CSA reports
* Maintain the CM Document Library
* Establish and maintain the CM Drawing Library.

### **REQUIREMENTS REVIEW**

During requirements review, the sum of developed system, software and hardware requirements are reviewed for completeness, correctness and feasibility.

CM activities are listed below:

* Provide the ***baselined system and/or software requirements*** required to conduct the requirements review.
* Maintain the CSA System.
* Record any changes to baselined CIs resulting from the requirements review.

### **SOFTWARE ARCHITECTURAL DESIGN**

During software architectural design, project groups participate in the definition and documentation of CI-wide design decisions in design documentation.

CM activities are listed below:

* Establish and maintain the corrective action process for the Developmental Configuration
* Maintain configuration control of Developmental Configuration products
* Maintain configuration control of Functional and Allocated Baselines
* Participate in joint management and technical reviews
* Support the CCB and CRB
* Maintain the CSA system and distribute CSA reports
* Maintain the CM Document and Drawing Libraries.

### **SOFTWARE DETAILED DESIGN**

During software detailed design, project groups develop a detailed design for each software component of the software configuration item and the interfaces between them.

CM activities are listed below:

* Place software design documents (Software Design Document (SDD), IDD, DBDD) under developmental configuration control.
* Receive and record software test requirements.
* Design Review

During design review, systems and/or software designs are reviewed for completeness, correctness and feasibility.

CM activities are listed below:

* + - Provide the ***baselined design documents*** required to conduct the Design Review
    - Maintain the CSA System
    - Record any changes to baselined CIs resulting from the design review.

### **SOFTWARE CODING AND TESTING**

During software coding and unit testing, project groups develop and document software corresponding to each software unit in the CI design.

CM activities are listed below:

* Maintain the corrective action process and provide status reports.
* Maintain configuration control of Developmental Configuration products (including source code and source code listings).
* Maintain configuration control of the Functional and Allocated Baselines.
* Participate in joint management and technical reviews.
* Support the CCB and CRB.
* Maintain the CSA system and distribute CSA reports.
* Maintain the CM Document and Drawing Libraries.
* Update CSA records for the appropriate CIs.

### **SYSTEM/SOFTWARE TEST READINESS REVIEW**

During System/Software Test Readiness Reviews (TRR), project groups resolve open issues concerning the status of the system/software test environment, the test cases and test procedures to be used for system qualification testing or hardware/software item qualification testing, and the status of the system/hardware/software to be tested.

CM activities are listed below:

* Provide the ***baselined requirements, test, and requirements traceability documents*** required to conduct the TRR.
* Maintain the CSA System.
* Record any changes to baselined CIs resulting from the TRR.

### **UNIT INTEGRATION AND TESTING**

During unit integration and testing, project groups establish test cases, test procedures, and test data to conduct unit integration and testing, and document information in appropriate Software Development File (SDF).

CM activities are listed below:

* Maintain the corrective action process and provide status reports.
* Maintain configuration control of Developmental Configuration products
* Maintain configuration control of the Functional and Allocated Baselines
* Participate in joint management and technical reviews
* Support the CCB and CRB
* Maintain the CSA system and distribute CSA reports
* Maintain the CM Document and Drawing Libraries
* Update CSA records for the appropriate CIs.

### **SOFTWARE QUALIFICATION TESTING**

During software qualification testing, project groups define, document and conduct test preparations, cases and procedures for software qualification testing, traceability between test cases and the software requirements, and generate a System/Software Test Description (STD) and System/Software Test Report (STR).

CM activities are listed below:

* Maintain the corrective action process and provide status reports
* Place testing documents (STD, STR) under Developmental Configuration control
* Maintain configuration control of Developmental Configuration products
* Maintain configuration control of the Functional and Allocated Baselines
* Participate in joint management and technical reviews
* Support the CCB and CRB
* Maintain the CSA system and distribute CSA reports
* Maintain the CM Document and Drawing Libraries
* Update CSA records for the appropriate CIs.

### **SYSTEM INTEGRATION**

During System Integration, project groups participate in the development, documentation and implementation of test cases, test procedures, and test data for conduct of system integration, and document system-related information in the appropriate SDFs and/or Engineering Notebooks.

CM activities are listed below:

* Maintain the corrective action process and provide status reports
* Maintain configuration control of Developmental Configuration products
* Maintain configuration control of the Functional and Allocated Baselines
* Maintain configuration control of System Integration test procedures and reports
* Participate in joint management and technical reviews.

***Guidance***

*If formal configuration audits are performed, include the following task:*

* Support FCA and PCA
* Support the CCB and CRB
* Maintain the CSA system and distribute CSA reports
* Maintain the CM Document and Drawing Libraries
* Maintain the Engineering Notebooks, SDL and SDF.

### **SYSTEM QUALIFICATION TESTING**

During system qualification testing, project groups perform qualification testing on target computer system or approved alternative system in accordance with system test cases and procedures, and document the results.

CM activities are listed below:

* Maintain the corrective action process and provide status reports
* Maintain configuration control of Functional and Allocated Baselines
* Participate in joint management and technical reviews
* Support the CCB and CRB
* Maintain the CSA system and distribute CSA reports
* Maintain the CM Document and Drawing Libraries
* Maintain Engineering Notebooks, SDL and SDF
* Ensure Test Reports are recorded and archived.

### **SOFTWARE INSTALLATION**

During Software Installation, project groups provide installation and checkout of executable software and/or systems at specified user sites, and provide training, and other specified assistance.

CM activities are listed below:

* Place product user documents (Software Product Specification (SPS), Software Version Description (SVD)) and user manuals (Software User Manual (SUM), Software Input/Output Manual (SIOM), System/Software Center Operator Manual (SCOM), Computer Operator Manual (COM)) under configuration control.
* Maintain the corrective action process and provide status reports.
* Maintain configuration control of Functional, Allocated and Product Baselines.
* Participate in joint management and technical reviews.
* Support the CCB and CRB.
* Maintain the CSA system and distribute CSA reports.
* Maintain the CM Document and Drawing Libraries.
* Maintain Engineering Notebooks, SDL and SDF.

### **SOFTWARE ACCEPTANCE/TRANSITION SUPPORT**

***Guidance***

*If used, System Acceptance/Transition Plans may be prepared by tailoring the template for a Software Transition Plan.*

During software acceptance/transition preparation, project groups prepare executable software and/or system for transition to support site.

CM activities are listed below:

* Archive Product Baseline
* Transfer Product Baseline to support site.

## PROJECT PRODUCTION PHASE

***Guidance***

*Individual projects must tailor this section to describe project activities derived from applicable standards and phasing consistent with the project’s PMP.*

Objectives of the Production phase are listed below:

* Establish a stable, efficient production and support base.
* Achieve an operational capability that satisfies the mission need.
* Conduct follow-on operational and production verification testing to confirm and monitor performance and quality, and verify the correction of deficiencies.

CM activities are listed below:

* Update CCB charter, CM Plan(s), Functional, Allocated and Product Baselines
* Ensure contractor and government control of FPC, Functional, Allocated and Product Baselines
* Provide training in the CM Process to the operating forces.

## PROJECT UTILIZATION PHASE

***Guidance***

*Individual projects must tailor this section to describe project activities derived from applicable standards and phasing consistent with the project’s PMP.*

Objectives of the Utilization phase are listed below:

* Ensure that the fielded system continues to provide the capabilities required to meet the identified mission need.
* Identify shortcomings or deficiencies that must be corrected to improve performance.

CM activities are listed below:

* Update the CCB charter, CM Plan(s), and the Functional, Allocated and Product Baselines.
* Continue control and accounting of the FPC, and the Functional, Allocated and Product Baselines.
* Participate in the conduct of audits as required.
* Provide training in the CM Process to the operating forces.

## PROJECT SUPPORT PHASE

***Guidance***

*Individual projects must tailor this section to describe project activities derived from applicable standards and phasing consistent with the project’s PMP.*

Objectives of the Support phase are listed below:

* Ensure that the fielded system receives the required logistics, maintenance and support services necessary to meet the identified mission need.
* Make any updates necessary to reflect operational experience with the fielded system.

CM activities are listed below:

* Record changes to configuration items that are approved by the CCB
* Update CSA records to reflect changes.

## PROJECT RETIREMENT PHASE

***Guidance***

*Individual projects must tailor this section to describe development activities derived from applicable standards and phasing consistent with the project’s PMP.*

Objectives of the Retirement phase are listed below:

* Ensure that the fielded system materials are prepared for disposal in accordance with project requirements.
* Identify, inventory and archive project records and records.

CM activities are listed below:

* Ensure final configuration records reflect the retirement of the project configuration items.
* Record transfer of retirement records, configuration items, and any supporting materials to storage or disposal as directed.

# DATA MANAGEMENT

***Guidance***

*Due to the growing complexity and volume of data, particularly digital data, a Data Management (DM) function that operates either separate from or within the CM Group may be needed. DM typically has responsibility for receiving, maintaining, storing, retrieving, and archiving all project data, both hard copy and digital.*

*This section should be used to address the handling, processing, storage, integrity, transfer, security, and maintenance of project technical data to ensure a repository is maintained for the project. A "Project Library" would be established to maintain all technical data and correspondence related to the project.*

The project has established a ***Project Library or name of library*** to ensure a repository of technical data is maintained for the project. This section describes the methods for processing, storage, integrity, transfer, security, and maintenance of CM technical data.

Data management responsibilities are listed below:

* Receive/obtain ***project documents, software, or project technical data***.
* Implement and apply the configuration identification scheme in accordance with Section 6 of this plan.
* Catalogue the ***project documents, software, or project technical data***.
* Maintain ***status records or database of project documents, software, or project technical data***.
* Establish and maintain secured data access and control.
* Provide change control.
* Record changes to CIs and the reasons for the changes, as appropriate.
* Provide distribution copies for project personnel or for outside distribution.
* Maintain review comments or files, and forward comments to document originators.
* Prepare and distribute status and inventory reports.
* Archive ***project documents, software, or project technical data***.
* Track ***project documents, software, or project technical data*** requiring response or action.

## DIGITAL DATA IDENTIFICATION

The DM Group provides configuration identification to digital data files to differentiate between similar files, and to maintain traceability to specific product configuration and document representations. DM applies the guidelines of ***cite the guideline;*** to implement digital data identification. ***Describe the implementation method here.***

## DATA STATUS LEVEL MANAGEMENT

The DM Group implements rules for establishing and maintaining data status level management, as listed below:

* Version/revision identification
* Data format and application software operability
* Conditions for access to data
* Identification of groups and/or persons authorized access
* Methods and requirements for approval of data
* Archiving rules for data/documents.
* DM applies the guidelines of ***cite the guideline,*** to implement data status level management. ***Describe the implementation method here.***

## MAINTENANCE OF DATA AND PRODUCT CONFIGURATION RELATIONSHIPS

The DM Group maintains the relationships of data files, document representations and key data elements.

DM applies the guidelines of ***cite the guideline,*** to implement the maintenance of data and product configuration relationships. ***Describe the implementation method here.***

## DATA VERSION CONTROL

The DM Group maintains disciplined version control to manage review of digital/document data.

DM applies the guidelines of ***cite the guideline,*** to implement data version control. ***Describe the implementation method here.***

***Guidance***

*The following is a sample data identification and version control method.*

The following requirements are used to identify and control data during the review and update cycle:

* Data files are uniquely identified and include file version and status, e.g., "working”, "released”. File naming conventions are used to indicate changes from previous versions or to distinguish an altered (annotated, redlined) file version from the originally-submitted file version (***e.g., filename.srs;2, or filename\_srs.ann;6***).
* Data and changes are transmitted in accordance with the ***submittal date specified on contract.***
* An acknowledgment of receipt from the receiving party is required when electronic data is being sent to the ***Government or receiving party***. The required time to respond is ***24 hours***. A follow-up is made after the ***24-hour*** period.
* Data that is electronically transferred to the ***Government or receiving party*** is identified and defined as follows:
  + "Working" - work in progress, not formally submitted or made accessible; provided for information or communication; subject to internal CM (version control).
  + "Released" - CM controlled version released or made accessible after review and approval; selectively provided to or accessed by the ***Government or receiving party***.
  + "Submitted" - CM controlled master version formally submitted or made accessible to the ***Government or receiving party***.
* "Approved" - CM controlled master version approved by the ***Government or receiving party.***
* Records are kept for each data transaction.

***Guidance***

*Describe the responsibilities of the Project Librarian for processing software or project technical data for project review or comment, collecting the review comments, and submitting the comments to the originator. The section should describe in detail the responsibilities of the Project Librarian.*

Data items submitted to the Project Library require that the Project Librarian acknowledge receipt, if required, and distribute software or project technical data to the designated reviewers in a timely manner. Distribution of ***project technical data*** is available in hard copy or electronic format. The ***contract's CDRL or identify other document*** allows ***30 days*** for review. The due date for submitting comments or recommendations against the item under review must be within ***30 days*** after Project Library date of receipt. The Project Librarian generates a cover memo or attaches a message to indicate the due date for submitting review comments. The Project Librarian acts as the focal point for receiving and collating all review comments prior to submitting the review comment package to the originator.

## DIGITAL DATA TRANSMITTAL

DM ensures that transmitted digital data products are usable, recorded on appropriate physical media, and affixed with proper identification to clearly identify its contents. When it is not possible to include all the contained file identifications, DM includes a reference to an accompanying listing or to a “read me” file.

DM applies the guidelines of ***cite the guideline,*** to implement digital data transmittal. ***Describe the implementation method here.***

## DATA ACCESS CONTROL

***Guidance***

*Define the following processes:*

* + *How data is to be accessed*
  + *Request for access and logging of access for read-only or annotations*
  + *Naming of temporary working version of files for the purpose of annotation or mark up*
  + *Means of indicating whether a comment or annotation is essential or suggested*
  + *Re-identification of marked up versions, as required*
  + *Method of indicating acceptance, provisional acceptance, approval, or rejection*
  + *Automated status accounting, including tracking the disposition of required changes*
  + *Re-identification of changed files.*

*If interactive data access of configuration data is not appropriate, describe the requirements stated above from the perspective of non-interactive data access.*

DM applies the guidelines of ***cite the guideline,*** to implement digital data identification and access control. ***Describe the implementation method here.***

## STATUS REPORTING

Data requirements defined by the project are incorporated into the ***name of the database used to track project deliverables***. The database is used to identify all project data, to prepare status reports, and to track approval history. The database contains each contractually required data item and information on data submission. In addition to the project item, the title of the data item and source references (e.g., Data Item Description (DID) number, paragraph number of applicable addendum) is included. Listed below are the main areas addressed in the status reports.

* Data deliveries completed in the previous period
* Data scheduled for submission
* Data due but not yet delivered
* Status of delinquent data.

## DATA SECURITY AND CLASSIFICATION MANAGEMENT

***Guidance***

*If any documents relating to this section are cited in the CMP, add them in Section 2.*

*Data security and classification management are an integral part of data management. Security requirements are considered during all areas of data management control. Classification and security activities are performed in accordance with* ***state the prevailing security standard or guideline.***

## MAINTENANCE OF DISASTER RECOVERY DATA

***Guidance***

*Some projects make provisions to store copies of designated data files in separate, sometimes remote, repositories for recovery in the event of catastrophic loss. If this applies to your project, add this subsection to ensure that there is ongoing coordination between Configuration Management, Data Management, and Remote Data Storage.*

The *[[Project Title]]* has arranged for separate storage of designated configuration items for recovery in the event of a catastrophic loss. DM identifies the items that will be copied and archived for disaster recovery. ***DM or other designate, such as CM*** will establish inventories of the remotely stored items, the required media for their storage, and periodic reviews of the inventories. DM will coordinate with CM to identify updated or new product baseline items that are to be copied and archived in remote storage. The project CSA Report will include a full inventory of these separately stored items.

# CONFIGURATION IDENTIFICATION

## SELECTION OF CONFIGURATION ITEMS

***Guidance***

*The project may want to include emphasis that configuration identification will be applied to all project elements, including hardware, software, drawings, storage media,documentation and any other identified elements for the project.*

*Example criteria for selecting CIs at the appropriate work product level include those listed below:*

* *Work products that may be used by two or more groups.*
* *Work products that are expected to change over time either because of errors or change of requirements.*
* *Work products that are dependent on each other in that a change in one mandates a change in the others.*
* *Work products that are critical for the project.*
* *Additional work products that may be identified, as part of a CI, are listed below:*
* *Procedures*
* *Requirements*
* *Design document*
* *Test plan and procedures*
* *Interface Description*

The selection of CIs to be placed under CM is the responsibility of project management or the developer. ***Describe or list the project-specific items to be selected as Cis, when they come under CM and at what level.***

***Guidance***

*Ensure that the following paragraph describes the items listed below:*

* *How configuration items are selected and the work products that compose them*
* *The assignment of unique identifiers to configuration items (may wish to reference Section 6.3 on identification)*
* *Specifying the important characteristics of each configuration item (may wish to reference Section 6.3 and note how the identification conventions include important characteristics of each CI)*
* Specifying when each configuration item is placed under configuration management (may want to reference Section 4, CM Phasing, as this is discussed there)
* Identifying the owner responsible for each configuration item (may want to reference Section 1.5, as this is discussed there).

The [Project Name] CM Group, working with [Project Name] management and personnel, uses the following methods to select and identify CIs. ***Describe the method and details, including the level of configuration management assigned each item, here***.

Once the project CIs have been identified and provided to the CM organization, this CMP will be updated.

## FORMAL BASELINE ESTABLISHMENT

For each CI, configuration identification is established for related hardware components, engineering/manufacturing/operation/maintenance documentation, software technical documentation, code, and media. The initially approved configuration identifications establish baselines from which subsequent changes are controlled. The configuration identifications and baselines to be established for [[Project Title]] CIs are defined as shown below:

***Guidance***

*To identify the documents required at each baseline, the author should refer to the project's PMP and the contract (in particular, the CDRLs listed in the contract as managed by the project management plan). A graphic illustration of the project's documentation tree and baseline should be included.*

* **Functional Baseline** - Listed below are the documents that comprise the Functional Baseline for *[[Project Title]].*

1. ***Document 1***

2***. Document 2***

3***. Document 3***

* **Allocated Baseline** - Listed below are the documents that comprise the Allocated Baseline for [[Project Title]].

1. ***Document 1***

2***. Document 2***

3***. Document 3***

* **Product Baseline** - Listed below are the documents that comprise the Product Baseline for [[Project Title]].

1. ***Document 1***

2***. Document 2***

3***. Document 3***

## IDENTIFICATION METHODS

The paragraphs below describe the methods used in identifying the CI and associated technical data and project-developed support components required for development, test, and maintenance.

### **DOCUMENT IDENTIFICATION**

Documents are assigned a unique identifier composed of ***identify the specific elements of the unique identifier.*** Figure 6-1 summarizes the numbering system used for documents. Each page of the document contains the identification number with the applicable revision letter.

***Guidance***

The following numbering schemas are only suggestions - the author may include or tailor the project-specific document numbering scheme shown in Figure 6-1.

Example: PROJECT\_ICD\_3.1A Ch Pg XX

Where

PROJECT = CI (project name) designator

ICD = Document Type (example: ICD = Interface Control Document)

3 = Document Version Number

1A = Document Revision Number (1 = 1st Major Revision; A = 1st Minor Revision)

XX = Change Page Number

**Figure 6-1. Document Numbering Identification**

***Guidance***

*The author may include or tailor the following project-specific document revision identificati**on scheme shown in Figure 6-2.*

* **Document Revision.** Document revisions are assigned an identifier composed of ***identify the specific elements of the unique identifier.*** Figure 6-2 summarizes the identification used for document revisions.

Example: PROJECT\_ICD**\_3.1A** Ch Pg XX

Where

PROJECT = CI (project name) designator

ICD = Document Type

***3 = Document Version Number (changed when document is completely reissued)***

***1A = Document Revision Number (1 = 1st Major Revision; A = 1st Minor Revision)***

XX = Change Page Number

**Figure 6-2. Document Revision Identification**

* **Document Change Pages**. Change pages are assigned an identifier composed of ***identify the specific elements of the identifier***. Figure 6-3 summarizes the identification used for document change pages.

Example: PROJECT\_ICD\_3.1A **Ch Pg XX**

Where

PROJECT = CI (project name) designator

ICD = Document Type

3 = Document Version Number

1A = Document Revision Number (1 = 1st Major Revision; A = 1st Minor Revision)

***XX = Change Page Number***

**Figure 6-3. Document Change Page Identification**

### **DRAWING IDENTIFICATION**

Drawings are assigned a unique identifier composed of ***identify the specific elements of the unique identifier.***

Example: PROJECT\_**DWG**\_3.1A Ch Pg XX

Where

PROJECT = CI (project name) designator

***DWG = Document Type (DWG = Drawing)***

3 = Document Version Number

1A = Document Revision Number (1 = 1st Major Revision; A = 1st Minor Revision)

XX = Change Page Number

**Figure 6-4. Drawing Numbering Identification**

### **HARDWARE/SOFTWARE IDENTIFICATION**

***Guidance***

*Discuss version identifier (including identifiers for development and release system hardware/software), system unit identification, etc. Address each identifier as a list item or subsection under this section. The author may include the project-specific hardware/software identification scheme as shown in Figure 6-5. Specific hardware serial numbers or relationship with higher-level systems/hardware may factor in the establishment of identification criteria.*

Each CI and all project-developed support systems hardware and software required for development and maintenance are identified with unique names, acronyms and/or numbers. CIs are assigned a unique identifier composed of ***identify the specific elements of the unique identifier.*** Figure 6-5 provides the identification system used.

Example: **PROJECT**\_**SQQ-89**\_3.1A

Where

***PROJECT = CI (project name for hardware/software system) designator***

***SQQ-89 = Item Sub Type (example: a hardware component SQQ-89)***

3 = Item Version Number (for hardware, may include or substitute CI serial numbers)

1A = Item Revision Number (1 = 1st Major Revision; A = 1st Minor Revision)

**Figure 6-5. Hardware/Software Identification**

* **Copy Number**. For accounting and traceability purposes, each copy of a product (e.g., hardware component, software issue) may be assigned a unique copy number both externally (identification label, etc.) and/or embedded within system software. Figure 6-6 illustrates how copy numbers are assigned.

Example: PROJECT\_SQQ-89\_3.1A **Copy NNN**

Where

PROJECT = CI (project name) designator

SQQ-89 = Item Type (example: a hardware component SQQ-89)

3 = Item Version Number

1A = Item Revision Number (1 = 1st Major Revision; A = 1st Minor Revision)

***NNN = Copy Number***

**Figure 6-6. Copy Number Identification**

* **Volume Number**. For software or documentation products that require more than one unit of physical storage per copy, a volume number is assigned to each unit of storage externally and, in the case of software, embedded in the software. The volume number is identified by ***identify the specific elements of the unique identifier.*** Figure 6-7 shows how volume numbers are assigned and labeled.

***Guidance***

*The author may include the project-specific volume numbering scheme as shown in Figure 6-7.*

Example: PROJECT\_DWG\_3.1A **Vol NNN**

Where

PROJECT = CI (project name) designator

DWG = Item Type (DWG = Drawing)

3 = Item Version Number

1A = Item Revision Number (1 = 1st Major Revision; A = 1st Minor Revision)

***NNN = Volume Number***

**Figure 6-7. Volume Number Identification**

* **Labels**. [[Project Title]] software and hardware are labeled for ease in identification. ***Describe the specific labeling practices being used.***

***Guidance***

*The types of information needed for this paragraph include the color of labels being used, the meaning associated with each color, etc. This information may be presented in a table.*

Listed below is the minimum information necessary to adequately identify software media.

* ***Identify each of the elements required on a label***.
* ***Identify each of the elements required on a label***.
* ***Identify each of the elements required on a label***.

### **FIRMWARE IDENTIFICATION**

***Guidance***

*This paragraph is applicable only if the organization is responsible for firmware. The author may include or tailor the project-specific firmware identification shown in Figure 6-8.*

The components of firmware, the hardware device and the computer instructions or computer data that reside as read-only software on the hardware device, are each uniquely identified. Firmware identification includes the top-level document/drawing that defines how these components fit together for the firmware assembly. Firmware is assigned a unique identifier composed of ***identify the specific elements of the unique identifier.*** Figure 6-8 summarizes the identification system for firmware.

Example: PROJECT\_**FW\_WS**\_3.1A

Where

PROJECT = CI (project name) designator

***FW = CI Type (FW = Firmware)***

***WS = CI Sub-type (WS = Workstation)***

3 = CI Version Number

1A = CI Revision Number (1 = 1st Major Revision; A = 1st Minor Revision)

**Figure 6-8. Firmware Identification**

### **CHANGE REQUEST FORM IDENTIFICATION**

***Guidance***

*Create a subsection for each form used to record a request for a change or report a problem. The author may include the project-specific change request identification as shown in Figure 6-9. The term “SCR” has been typically defined as a Software Change Request, but may be defined by the project as appropriate, e.g., System/Software Change Request.*

Each change request form received by CM is assigned a unique identifier. The change request number is identified by ***identify the specific elements of the unique identifier.*** Figure 6-9 summarizes the identification system used for change request.

Example: SCR-NNN

Where:

SCR = Change Request Identifier (e.g., SCR = System Change Request, ECP = Engineering Change

Proposal, TR = Trouble Report)

NNN = Change Tracking Number

**Figure 6-9. Change Request Identification**

## DEVELOPMENTAL CONFIGURATION – CORRECTIVE ACTION PROCESS

***Guidance***

*System and Software Engineering Groups often are responsible for development item control until they are deemed sufficiently fabricated (hardware) or coded (software) or drafted (documentation) to establish an initial development baseline and be taken under CM control by the CM Group. The CM Group supports the System and Software Engineering Group’s CM control by overseeing development configuration access and internal controls, which, though informal, must still be followed to prevent uncontrolled duplication of development items. If the CM group is responsible for Developmental Item control (would also need to modify Section 3.1.1.2), modify the statement below.*

Anomalies or discrepancies against the Developmental Configuration are resolved through a corrective action process. The corrective action process is a closed-loop process, ensuring that all detected problems are promptly reported and entered into the process, action is initiated on them, resolution is achieved, status is tracked and reported, and records of the problems are maintained for the life of the product.

The corrective action process is the development team's internal control over configuration items that are evolving from requirements and being developed through design, code and unit test (for software), development and fabrication (for systems and hardware), integration test, and system test.

The CM Group assists the Systems and Software Engineering Groups to maintain developmental configuration control and therefore provides the status of implementing change proposals and closing out change request forms. The paragraphs below describe the steps of processing a change request form:

***Guidance***

*The paragraphs below are provided to give the author an example of a corrective action process. Modify the paragraphs below (a through d) to reflect the process used for controlling changes to Developmental Configuration for the project being described. It may also be beneficial to add a figure illustrating this process.*

* The initiator reports a problem using a change request form and submits it to the CM Group.
* CM assigns a ***change request form*** tracking number, updates ***the change request form*** tracking database, and provides a copy to the Systems and Software Engineering Groups for problem analysis and proposed solution. The library maintains a master copy of the change request form.
* The approval authority (***cite the approval authority, usually the CCB)***determines the corrective action to be taken and the priority of the action. Corrective actions may be returned to the Systems and Software Engineering Groups for implementation, or sent to another group for review or action.
* The Systems and Software Engineering Groups implement the approved solution and provide status of the implementation and completion to the CM organization. Implementation includes updating the software and configuration documents. Implementation is considered complete when the integration and testing of the change request passes test criteria.

## CONFIGURATION MANAGEMENT LIBRARIES

The Developmental Configuration management process includes the responsibility to control documentation and repositories containing elements of the Developmental Configuration. The *[[project organization]]****.*** The following sections describe the functions of each of the libraries.

***Guidance***

*This section should be tailored to reflect library control of all the project elements, including hardware, software, drawings, documents, and other project-identified components. If the developmental activity is also the System/Software Support Activity (SSA), an active repository is required; the Documentation Library's role may be expanded to include software, or a separate software repository may be established. In any case, this software is under configuration control. CM procedures should be described in the procedures for establishing and maintaining Configuration Libraries.*

Project management authorizes access to each of the [[project organization]] libraries. Access includes types of user privileges granted (e.g., for software: read, write, execute; for documentation: loan copy, distribution copy).

***Guidance***

*The procedures for Configuration Identification should include a procedure for library access control. Cite the appropriate reference for the procedure.*

### **SOFTWARE DEVELOPMENT LIBRARY**

***Guidance***

*Hardware development projects should use Section 6.5.4 to describe project libraries that support product development.*

The SDL is the controlled collection of documentation, intermediate system/software development products, associated tools, and procedures that comprise a Developmental Configuration CI. The SDL provides storage of and controlled access to software development products in human-readable form, machine-readable form, or both. SDL components are initially documented in an identification list for the Allocated Baseline. Section 6.3 of this CMP describes identification for the SDL collection.

***Guidance***

*The procedures for Configuration Identification should include detailed procedures for SDL control.*

*The following description outlines the typical SDL control for software produced under the “waterfall” system development method. Projects not developing or using software may indicate this subsection is not applicable, but should carefully consider whether any software is used in the development of their product, and if so, should consider establishing a project SDL. A graphic showing the product development evolution would be helpful. Figure 6-10 is a sample software product development evolution graphic. If your organization produces software or systems under a more dynamic process, tailor your document accordingly.*

The *[[project organization]]* SDL consists of a series of phases through which the software is developed. Before software is released from one development phase to the next, it must be validated by a Quality Assurance function and verified by CM. CM uses the ***name the tool or briefly explain the process*** to perform this verification. CM verifies that approved software changes have been incorporated into the proper phase of the SDL, reports status to the CCB, and performs the release function upon CCB authorization.

***Guidance***

*The release function for software should be detailed in the procedures for Configuration Identification, both for engineering release to a user and for internal release from one development phase to the next.*

### **DOCUMENTATION LIBRARY**

The [[project organization]] Documentation Library contains the controlled collection of the project’s entire document inventory, in any media, for both released and development versions. It houses both deliverable and non-deliverable products (e.g., preliminary versions of baseline documents, specifications on commercial-off-the-shelf (COTS) tools). The Documentation Library for a newly-designated baseline is established at the same time as its Developmental Configuration, and its components are initially documented in an identification list for the Allocated Baseline. Section 6.3 of this CMP describes identification of the Documentation Library collection. CM verifies that new documents that are entered into the library as CIs have been approved by the CCB and that only approved document changes have been incorporat­ed into all controlled documents. CM activates the release process upon CCB authorization.

***Guidance***

*The procedures for Configuration Identification should include a procedure for Documentation Library control that includes the document release function.*

### **DRAWING LIBRARY**

The *[[project organization]]* Drawing Library contains the controlled collection of all of the project's drawings, Computer-Aided Design (CAD), and Computer-Aided Manufacturing (CAM) instructions. The Drawing Library for a newly-designated baseline is established at the same time as its Developmental Configuration, and its components are initially documented in an identification list for the Allocated Baseline. Section 6.3 of this CMP describes identification of the Drawing Library collection. CM verifies that approved changes have been incorporated into drawings originated by and under control of the *[[project organization]].* Non-developmental software (NDS), COTS drawings and CAD/CAM items of the Drawing Library collection are identified in accordance with Section 6.3 of this CMP, but are not under configuration control of the *[[project organization]].*



**Figure 6-10. Sample Product Development Evolution**

***Guidance***

*The procedures for Configuration Identification should include a procedure for Drawing Library control that includes the drawing release function. If the Hardware Drawing Library is discussed in another CM Plan, reference that plan. If drawings are not applicable to the project then this section should be omitted.*

### **ENGINEERING NOTEBOOKS**

***Guidance***

*Projects engaged only in hardware development or other projects that use only Engineering Notebooks may interchange this section with Section 6.5.1.*

The [[project organization]] establishes and maintains Engineering Notebooks that include the collected requirements, specifications, technical approach, design, engineering and testing of the product. Engineering Notebooks shall include minutes of technical working groups and meetings, issues, risks, and action items during the accomplishment of the technical tasks relating to the development of the product. Product version-specific supporting data will be identified to ensure that appropriate supporting materials are catalogued to the appropriate product baseline.

***Guidance***

*Engineering Notebooks may be required, in lieu of SDL or SDFs, for those projects developing hardware products. Engineering Notebooks may be developed in concert with SDL and SDFs for projects concerned with the development of both hardware and software products.*

# INTERFACE MANAGEMENT

***Guidance***

*This section may not apply to all projects. If it does not apply, insert a statement to the effect that currently no interface requirements have been established for the system.*

This section identifies the interface requirements and establishes the Interface Control Working Group (ICWG). Interface management is performed to ensure compatibility and interoperability among various hardware and software components in a system as specified in the baselined configuration documentation.

## INTERFACE REQUIREMENTS

Listed below are the interface requirements for [[Project Title]]:

***Guidance***

*List your interface requirement specification and/or document.*

* + ***System Interface Requirement number 1***
  + ***System Interface Requirement number 2***
  + ***System Interface Requirement number 3.***

## INTERFACE CONTROL WORKING GROUP

***Guidance***

*Interfacing systems require an additional level of configuration oversight and control. In this section, describe the role of CM for the project in ensuring CM activities between interfacing systems are coordinated, timely, and address the ramifications of changes from one system to other interfacing systems*.

The ICWG is chartered to ensure the compatibility of the software and hardware components within the project system, or among other interfacing systems. The ICWG is composed of members representing the interfacing systems outlined in Section 7.1 and representatives from the system design group. The ICWG meetings will include discussions of the interface control documentation.

CM will coordinate configuration control activities for interface items. This may include the activities listed below:

* Attending CCB meetings with interfacing systems.
* Participating in integrated systems configuration management working groups.
* Ensuring change control actions between interfacing systems are communicated to all stakeholders.
* CM may be required to generate and distribute CSA reports and technical data for interfacing systems.

***Guidance***

*CM may provide administrative support; if so, document the CM Group’s involvement.*

# CONFIGURATION CONTROL

***Guidance***

*The purpose of this section is to describe the activities to maintain the integrity of baselined CIs and their associated documentation by ensuring that only authorized changes are incorporated. This requires the systematic evaluation, processing, and approval or disapproval of all proposed changes. Configuration control begins when a CI is baselined and continues as further baselines are established. To successfully implement configuration control, the CM Manager, working with the PM, should define the appropriate levels of configuration control for all CIs within the system. For example, a specification, administrative policy, or technical drawing originated by a governing Program Office should be configuration controlled by that Program Office’s CM; this section should therefore describe the CM activities conducted between the Program Office and the Project to control those CIs. CM of interfacing hardware, systems and/or software should include a clear understanding among all stakeholders of the various agencies involved in the overall System architecture, and the respective CM entities of each of the interfacing agencies should have a clear understanding of each agency’s scope and span of CM control. The required span of control should be reflected in the establishment of the control boards and the change control process established in this section.*

*This section should also elaborate on how the CMS described in Section 3.3.4 is used to facilitate configuration control activities, and how and by whom the system is used.*

This section describes the process for maintaining configuration control of all identified CIs developed or maintained by [[originating organization]].

CM is responsible for maintaining configuration control over configuration items in the Developmental Configuration and the Functional, Allocated, and Product Baselines. In addition, CM is responsible for administering the process by which a request for change to products under control is submitted, reviewed, and approved or disapproved.

## BOARDS

***Guidance***

*It is understood that each organization has a unique hierarchy and linkage among boards. A separate numbered section should be dedicated to each of these boards. It may also be helpful to include a figure, such as Figure 8-1 below, that illustrates the linkage among the boards. Note that in this example, local, or project-level CCBs may include separate CCBs for Hardware and Software.*

The [[originating organization]] is subject to a hierarchy of control boards for baseline integrity. A description of each of these boards, along with their functions and responsibilities, is presented in the sections below.

### **CCB**

A CCB has been established to authorize changes to baselined documentation, hardware and software and for in-development products. The specific procedures for conducting a CCB meeting are detailed in ***document name***.

Program Level CCB

System Level CCB

System Level CCB

System Level CCB

Local CCB

Local CCB

Local CCB

Subsystem CCB

**Figure 8-1. [[Project Title]] Configuration Boards**

* **CCB Responsibilities**. The CCB has authority for managing the project's product through the performance of the functions listed below:
* Authorize establishment of configuration baselines and identification of CIs.
* Represent interests of project management and all groups who may be affected by changes to the baselines.
* Assign, review, and provide for disposition of action items.
* Provide required staff coordination on all proposed or reviewed changes or modifications.
* Serve as a source for the coordination of technical expertise for the project.
* Determine or review the availability of resources required to complete the proposed change or modification, assess the impact of the proposed change upon the system, examine cost considerations, and determine the impact of the change on development and test schedules.
* Monitor the design, production, and validation process for approved modifications, and initiate, when required, the corrective actions necessary to ensure design compatibility and integrity, cost-effectiveness, and conformance to scheduled milestones.
* Direct implementation of modifications approved by the CCB.
* Exercise interface management support and control for project products.
* Identify Class II and I change requests in accordance with Section 8.2.1 of this plan.
* Approve Class II changes and recommend approval for Class I changes.
* **CCB Composition**. ***CCB Chairperson Title*** or a designated representative chairs the CCB. Board members include representatives of the functions designated below:

***Guidance***

*Personnel listed below represent a project involved with the development of both hardware and software products. Tailor the list to reflect the actual scope of the project.*

* CM
* Requirements
* Design/Development
* Software Test
* Software Engineering
* QA
* Systems Engineering
* Logistics
* System Test
* Technical personnel directly associated with problems or proposed changes to be reviewed.

CM schedules and coordinates CCB meetings, including the creation and distribution of meeting agenda and minutes. For time-critical problems, an emergency CCB meeting may be convened. ***Position Title*** has the authority to call an emergency CCB meeting. The required attendees are listed below.

* CCB Chairperson
* CM Manager
* Requirements Manager
* Design Manager
* If applicable, the manager of the group that documented the problem.
* **Roles of CCB Members**. The sections below describe the roles of CCB members.
* **CCB Chairperson**. Ultimate authority for the CCB rests with project management. A CCB Chairperson is appointed by the Project Manager to serve as Project Manager agent for CCB activities. The CCB Chairperson reports all CCB activities to the Project Manager. The responsibilities of the CCB Chairperson are listed below:
* Schedule and conduct CCB meetings.
* Ensure that notice of each CCB meeting is furnished sufficiently in advance so that representatives may attend completely prepared.
* Evaluate and adjudicate proposed changes.
* Present recommended changes from the CCB to the Project Manager to assist in determining which change requests will be processed for implementation.
* Coordinate implementation of configuration changes approved by the Project Manager.
* Sign the written synopsis of matters considered and recommendations made by the CCB. (The synopsis is made a permanent part of the proceedings of the CCB, and copies of the synopsis are distributed to all CCB members.)
* Ensure that all affected stakeholders review proposed changes for the next baseline, and obtain agreement with those proposed changes.
* Track the status of change requests to closure.
* **CCB Secretariat**. The [[originating organization]] provides a secretariat (e.g., the CM Manager) to perform the administrative functions listed below:
* Prepare, coordinate, and distribute the CCB meeting agenda.
* Act as recording secretary during CCB meetings.
* Prepare and distribute the CCB meeting minutes.
* Perform additional staffing functions as directed by the CCB Chairperson.
* When additional evaluation or impact analysis is made, prepare the written synopsis of matters considered and recommendations made by the CCB.
* Distribute copies of signed synopsis to all CCB members.
* Update the CM database with the minutes/results of the CCB.
* **Other CCB Members**. All CCB members represent their respective activities regarding all proposed changes brought before the CCB, and participate in the review and recommended disposition of these proposed changes. Their duties include those listed below:
* Receive copies of all proposed changes submitted for CCB consideration.
* Review, evaluate, and coordinate with other offices, as required, to determine impact of all proposed changes.
* Attend meetings of the CCB to present position statements on proposed changes.
* Assist in the preparation of composite ***ECP or local*** form.
* Assist the [[originating organization]] in the analysis of the impact of proposed changes in their area of expertise and make recommendations for the adjudication of proposed changes.
* Perform other tasks as assigned by the CCB Chairperson.

### **OTHER LOCAL BOARDS**

***Guidance***

*Add an additional section heading and subheadings for responsibilities and composition for each local board (e.g., Developmental Configuration Review Board, Technical Review Board, Developmental Change Review Board).*

### **OTHER BOARDS**

***Guidance***

*Add an additional section heading and subheadings for responsibilities and composition for each external board (e.g., Operational Advisory Group/Maintenance Advisory Group).*

### **CHANGE REVIEW BOARD**

***Guidance***

*If the Program Office has documented a Change Review Board in a program-level CM Plan, this section need only reference that document. If there is no higher-level Program Office governing this project, this section may be deleted as not applicable. The project should so state here, and in its organization chart, that no such controlling Program Office CRB exists; however, if the Program Office uses the term “CCB” vice CRB to name its controlling Program Agency, use this section and tailor the terminology appropriately*

The management team required to establish and maintain configuration control of products consists of the sponsor and an established CRB.

* **CRB Responsibilities**. The CRB is responsible for evaluating, approving or disapproving proposed configuration changes at the program level. The evaluation of proposed changes considers, as a minimum, such factors as documentation, equipment interfaces, training equipment, implementation costs, and performance requirements. The CRB ensures that all affected stakeholders review proposed changes to baselines, and obtains their agreement to implement those changes.

Proposed changes submitted for CRB action must be complete with respect to technical requirements, justification, cost information, logistic requirements, interface requirements, retrofit requirements, and other applicable information. When a proposed change affects any system or item under the cognizance of another CRB, joint CRB meetings are held, as required. The CRB tracks the status of all proposed changes through to closure.

* **CRB Composition**. The CRB consists of the members listed below:
* Program Manager or Acquisition Manager (AM)
* CRB Chairperson (designated by the Program Manager or AM)
* *Sponsor Representative*
* Representatives of participating field activities
* Representatives of the [[originating organization]].

In addition, advisory personnel from each of the areas listed below are included in the CRB, as required:

* Product end-users
* Test and evaluation personnel
* Contractor and system developer
* Interfacing systems CRB representatives.

In specific cases, representatives of other divisions and offices may be required to serve as advisors to the board. The CRB Chairperson coordinates the participation of these divisions.

* **Roles of CRB Members**. The following sections describe the roles of CRB members.
* **CRB Chairperson**. Ultimate authority for the CRB rests with the [[CRB program management]]. A CRB Chairperson is appointed by the Program Manager to serve as the program management agent for CRB functions. The CRB Chairperson reports all CRB activities to the Program Manager. The responsibilities of the CRB Chairperson are listed below:
* Schedule and conduct CRB meetings.
* Ensure that notice of each CRB meeting is furnished sufficiently in advance so that representatives may attend completely prepared.
* Ensure that ***task statements***, work unit assignments, and contract changes are issued to fund CRB members for direct CRB participation.
* Evaluate budgetary estimates of CRB members for proposed changes.
* Evaluate and act on proposed changes (i.e., approve/disapprove).
* Present recommended changes to the Program Manager and AM to assist them in determining which change requests will be processed for implementation.
* Coordinate implementation of changes approved by the Program Manager and AM.
* Present composite ***ECP or local forms*** requesting new baseline programs to the appropriate CCB.
* Sign the written synopsis of matters considered and recommendations made by the CRB. (The synopsis is made a permanent part of the proceedings of the CRB, and copies of the synopsis are distributed to all CRB members.)
* **CRB Secretariat**. The [[originating organization]] provides a secretariat (e.g., the CM Manager) to perform the administrative functions listed below:
* Prepare, coordinate, and distribute the CRB meeting agenda.
* Act as recording secretary during CRB meetings.
* Prepare and distribute CRB meeting minutes.
* Prepare the composite ***ECP or local form***.
* Perform additional staffing functions as directed by the CRB Chairperson.
* When additional evaluation or impact analysis is made, prepare the written synopsis of matters considered and recommendations made by the CRB.
* Distribute copies of signed synopsis to all CRB members.
* **Other CRB Members**. All CRB members represent their respective activities regarding all proposed changes brought before the CRB, and participate in the review and disposition of proposed changes. Their duties include those listed below:
* Receive copies of all proposed changes submitted for CRB consideration.
* Review, evaluate, and coordinate with other offices, as required, to determine the impact of all proposed changes.
* Attend CRB meetings to present position statements on proposed changes.
* Assist with the analysis of the impact of proposed changes.
* Perform other tasks as assigned by the CRB Chairperson.

## BASELINE CHANGE PROCESS

The [[project organization]] baseline change process is a continuous function that involves the preparation, implementation, and distribution of CI and associated documentation changes. It has been approved by the [[sponsor organization]] and involves activity at both the project and program levels.

***Guidance***

*These statements and the following paragraphs assume that the project organization is both the developmental activity and SSA for the product. If this is not the case, tailor your document accordingly.*

The assigned responsibilities and approval authority for accomplishing changes to baselines are detailed in a project-originated CCB charter documented in list the document name. This charter interfaces with the [[sponsor organization]] charter. The charter establishes the processing of change requests and their resolution by local and [[sponsor organization]] boards.

Changes to a [[project organization]] baseline configuration are initiated through a change request process that involves the preparation of a defined series of documents (change forms) whose status is determined by a hierarchy of control boards. Change requests are used to report problems and propose changes or enhancements to configuration items or documentation. A change request must be documented, submitted, reviewed, and approved prior to implementation. Change requests against developmental baselines are resolved by the [[project organization]] CCB (if not the CCB, identify the board). Change requests against established baselines require approval of the [[sponsor organization]] CRB.

The [[sponsor organization]] specifies a change classification schedule and a series of change forms for the conduct of configuration control in accordance with [[the guiding standard]]. The [[project organization]] uses this standard for controlling changes addressed by the [[sponsor organization]] boards. A description of the change classification definition and various change forms is presented in the following sections.

### **CHANGE CLASSIFICATION**

Configuration changes to baselines are categorized as either Class I or Class II. Changes will be designated Class I in accordance with [[the guiding standard]]. A Class I change would be required if any of the following were affected:

* The Functional, Allocated, or Product Baseline documentation
* Complete schedules
* Any of the following contractual factors:
  + Cost to government, including incentives and fees
  + Contract guarantees or warranties
  + Contractual deliveries
  + Scheduled contract milestones.

The [[project organization]] requires that all Class I changes be processed via an ECP. All changes to CIs that do not meet one or more of the Class I change requirements are identified as Class II changes. Examples of Class II changes are the following:

* Changes to correct editorial errors.
* Additions to clarifying notes or diagrams.
* Changes to hardware that do not affect any Class I criteria listed in [[the guiding standard]].

### **CHANGE REQUEST FORMS**

The [[project organization]] uses the following change forms for control of its baselines:

* Engineering Change Proposals (ECPs)
* Specification Change Notices (SCNs)
* Notices of Revisions (NORs)
* Deviations
* Local change requests insert title of local change request.

***Guidance***

*The ECP and related forms are still considered viable documents to use to support CM, and should continue to be used to document all proposed changes to system and software configurations.*

* **Engineering Change Proposal**. The ECP, prepared in accordance with [[the guiding standard]] and using DD Form 1692, is used to document all proposed changes to established baselines. The completed ECP must include detailed descriptions, justifications, and costs for the proposed change. [[Sponsor organization]] approval is required to implement Class I ECPs.

In addition to the foregoing, ECPs may originate as emergency or urgent problem reports from end users. The request must be confirmed by written message within ***24 hours*** and followed by a formal ECP within ***30 days*** after the first communication unless otherwise specified by the Government.

[[Sponsor organization]] does not review and approve Class II ECPs. The cognizant Contract Administration Office or CCB approves each Class II ECP with CRB concurrence.

***Guidance***

*Contractors only: If you do not have custody of the design, lists, and other documents comprising a CI, each Class II ECP is approved by the cognizant contract authority.*

* **Notice of Revision**. The NOR is primarily intended for use when the master drawing list and other documents comprising the configuration item are not held by the originator of the ECP. NORs permit the ECP previewing or approving activity to direct the custodian of an applicable document to make specific revisions in affected documents. A separate NOR, prepared in accordance with [[the guiding standard]], is created for each drawing, associated list, or other referenced document that requires revision when the related ECP is approved. The description of the revision consists of a detailed statement covering each required correction, addition, or deletion.

***Guidance***

*Contractors only: If you do not have custody of the design, lists, and other documents comprising a CI, each minor deviation is approved by the cognizant contract authority. NOTE: In past CM guidelines, “Deviations” have been separately identified as “Deviations” and “Waivers”, with deviations referring to requests for a variance from the applied process, and the waiver referring to the documented request itself. These terms have been combined into the Deviation term.*

* **Deviation**. A request for deviation is designated as minor, major, or critical following the criteria of [[the guiding standard]]. Critical and major deviations are processed in the same manner as Class I ECPs. The Contract Administrative Office or CCB authorizes minor deviations with CRB concurrence.

***Guidance***

*Use this paragraph to describe your local change request form and a high-level description of its processing. An accompanying table with instructions for its completion is recommended. Each standard has its own unique problem priority definitions and should be referenced as applicable. Tailor this section to cite the guiding standard and problem priority definitions described in Tables 8-1, 8-2 and 8-3.*

* **Local Change Request**. Table 8-1 describes the baseline change process used by the [[project organization]]. Table 8-2 displays problem priorities as defined. Table 8-3 shows categories to be used for classifying problems in products.

***Guidance***

*Document Change Requests may be required to initiate changes to project documentation (see guidance for Section 8.2.2.2 above). If this is the case, include the following section.*

* **Document Change Request.** The last page of this CMP provides a Document Change Request form that is used to request changes to this document. It may be tailored and used for all project documents. The initiator of the request prepares the DCR, and forwards it to the CCB for review and approval. ***Specify any other required project processing of DCRs here.***

***Guidance***

*This table presents a typical baseline change process used by a development activity. Modify the description to reflect the process used by your project organization for controlling changes to baselines.*

Table 8-1. Baseline Change Process

|  |  |  |  |
| --- | --- | --- | --- |
| **ACTIVITY** | **RESPONSIBILITY** | **CM INTERFACE** | **COMMENTS** |
| Change Request Initiator | Use (local) change request to report problem, error, or deficiency; or to request enhancement, change, or new requirement.  Submit change request to CM. | Assign tracking identification.  Input appropriate data to CSA database.  Provide copies of change request for review.  Place master change request in library. | CM should automate this process to the fullest extent of its capabilities. Eliminate paper whenever possible. |
| CCB | Convene meeting.  Disposition, prioritize, and categorize ***or other appropriate standard*** and detailed in Tables 8-2 and 8-3.  Direct implementation of change requests to developmental baselines.  Direct preparation of preliminary change proposals to delivered baselines for CRB working group consideration. | Distribute relevant CSA reports.  Update CSA databases.  Perform secretariat duties when requested. |  |
| CRB Working Group | Convene meeting.  Disposition and prioritize change proposals.  Identify approved change proposals for new baseline configuration.  Direct preparation of Class I ECP. | Distribute change proposals and associated documentation.  Perform secretariat duties when required. | If an organization does not require a Class I ECP for CRB review, CM will provide and prepare, as requested, the appropriate documentation. |
| System/ Software Requirements Group | Prepare Class I ECP for CRB review.  Determine whether deviations are required; prepare if necessary. | Provide CI and associated technical data required for ECP development.  Assign identification or tracking number to ECP.  Prepare SCNs, if applicable, and NORs for submittal with completed ECP.  Prepare ECP release package to CRB.  Update CSA database. |  |
| CRB | Convene meeting.  Review Class I ECP.  Direct implementation of acceptable ECP.  Return unacceptable ECP for rework by project organization. | Provide appropriate tracking for ECP.  Update CSA database. |  |
| System/ Software Engineering Group | Implement approved ECP.  Provide design status and information to CCB. |  |  |
| CCB | Begin CCB oversight of new Developmental Configuration.  Initiate corrective action process.  Determine development milestones. | Identify, process, and track change requests.  Provide CCB secretariat function.  Assist with reviews and audits as required. |  |
| Design & Development Group | Update configuration items and configuration documents. | Receive and process configuration item and documentation changes. |  |
| System/ Software Test Group | Perform V&V of project-developed products based on test plans and procedures.  Generate change requests for problems detected during test. | Receive test documents for configuration control.  Identify, process, and track change requests reported during testing. |  |
| Quality Assurance Group | Perform review and audits of baseline software. | Assist QA in conduct of reviews and audits as required. |  |
| CCB | Release Developmental configuration as Product Baseline. | Perform release function for accepted Product Baseline. |  |

Table 8-2. Explanation of Priorities

|  |  |
| --- | --- |
| **PRIORITY** | **APPLIES IF A PROBLEM COULD:** |
| 1 | * Prevent the accomplishment of an operational or mission essential capability. * Jeopardizes safety, security, or other requirement designated “critical”. |
| 2 | * Adversely affect the accomplishment of an operational or mission essential capability and no work-around solution is known. * Adversely affect technical, cost, or schedule risks to the project or to life cycle support of the system, and no work-around solution is known. |
| 3 | * Adversely affect the accomplishment of an operational or mission essential capability but a work-around solution is known. * Adversely affect technical, cost, or schedule risks to the project or to the life cycle support of the system, but a work-around solution is known. |
| 4 | * Result in user/operator inconvenience or annoyance but does not affect a required operational or mission essential capability. * Result in inconvenience or annoyance for development or support personnel, but does not prevent the accomplishment of those responsibilities. |
| 5 | * Result in any other effect. |

Table 8-3. Categories Used for Classifying Problems in Products

|  |  |
| --- | --- |
| CATEGORY | APPLIES TO PROBLEMS IN: |
| a. Plans | One of the plans developed for the project |
| b. Concept | The operational concept |
| c. Requirements | The system or software requirements |
| d. Design | The design of the system or software |
| e. Software/Hardware | The software code or hardware component |
| f. Database/data file | A database or data file |
| g. Test information | Test plans, test descriptions, or test reports |
| h. Manuals | The use, operator, or support manuals |
| i. Other | Other system or software products |

* Engineering Release

***Guidance***

*Describe the engineering release system, the use of this system, and the forms used to issue CI and associated technical data to the project organization upon authorization.*

Add a description of the local form in Section 1.7 (and include in Appendix B) used by the project organization.

The system/software release process begins at the start of system integration and testing. At the initiation of this phase, the Product Baseline is established by the project’s CCB. The release identified as part of the Product Baseline is provided for integration with the operational hardware. Operational Test and Evaluation personnel (OT&E) accomplish final testing. Issues found by OT&E are resolved using the baseline change process. Upon satisfactory completion of OT&E, the product release is approved as the Product Baseline Configuration. Approval for service use initiates distribution to end-users. CM/DM is responsible for making and distributing copies of products. The copies are made from the baselined Configuration Item master. CM is responsible for ensuring that the correct product and release documentation are distributed through DM.

# CONFIGURATION STATUS ACCOUNTING

***Guidance***

*This section describes the recording and reporting of information needed to manage CIs effectively, including the items listed below:*

* + *A record of the approved configuration documentation and identification numbers.*
  + *The designation owner, or author, or responsible points of contact for project CIs and supporting elements.*
  + *The status of proposed changes, deviations to the configuration.*
  + *The implementation status of approved changes.*
  + *The configuration of all units of the CI in the operational inventory.*
  + *Results of audits.*

CSA documentation is the means through which actions affecting CIs are recorded and reported to the ***Systems and/or Software Engineering Manager*** of the [[Project Title]] system. It principally records the "approved configuration" (baseline) and the implementation status of changes to the baseline. It is the bookkeeping part of CM that provides managers with feedback information to determine whether decisions of the CCB are being implemented as directed.

To automate CSA, CM uses ***identify the software tool***, to define the data content and format. ***Identify the software tool*** is an approved, baselined CI, so any proposed change to it requires a change request and CCB approval for implementation.

***Guidance***

*If the above paragraph does not reflect current practices, modify the paragraph, as required.*

Input data includes CCB decisions, such as approving or disapproving change requests, establishing configuration baselines, and approving the release of the product for distribution. Input data also includes status information of CIs and change requests. Output data is formatted as CSA reports.

## RECORDS

The records maintained by CM contain detailed data that documents that the as-built product conforms to its technical description and specified configuration. They include the information listed below:

* Approved technical documentation for each CI
* Status of proposed changes
* Implementation status of approved changes
* Status of problems
* A record of change request status.

### **CHANGE REQUEST TABLE**

The change request table contains a record of all change requests and related information. It includes, but is not limited to, the data listed below:

***Guidance***

*It may be beneficial to include a description or figure showing the format of this form.*

* Change request number
* Title
* Date
* Product/software name or acronym
* Part number or revision in error
* Originator
* Change source (e.g., ECP), if applicable
* Current change request status
* Change request disposition.

### **LIBRARY INVENTORY TABLE**

The library inventory table contains a record of each product stored in the library(ies). It includes, but is not limited to, the data listed below:

***Guidance***

*It may be* *beneficial to include a description or figure showing the format of this form.*

* Product name
* Part or document number and revision
* Date of creation, last modification, and last access
* "Master" or "Copy" designation
* Authorizing paperwork type and number
* Type of media
* Location
* Classification.

### **DATA DISTRIBUTION TABLE**

The data distribution table contains a record of all data (e.g., documents and drawings, including CDRL items) distributed by the organization through DM. The table includes, but is not limited to, the information listed below:

* Type and identification number of distribution request
* Date of submittal
* Media identification
* Reason for distribution
* Classification.

### **RELEASE TABLE**

The release table contains a record of all releases made by the organization (e.g., components, drawings, documents, software, documents, tape). It includes, but is not limited to, the information listed below:

* Date of release
* Type of release
* Product released
* Changes incorporated into the release
* Approval signatures
* Location of masters.

### **ARCHIVE RECORDS TABLE**

CM baselines and maintains a record of all archived material. Archived material includes obsolete material and data not required for current use and backup data stored offsite in case of loss of online data. Identify and list the project-specific archived materials for the project here or reference a separate document or Appendix. Include all materials, information, hardware and software necessary to support all extant versions of the product, or if desired, to recreate prior baseline versions of the product.

## REPORTS

***Guidance***

*The advent of web-based CM information systems has changed the accessibility of CSA reports. Online query capabilities can permit customized, tailorable query and reporting of CSA data. If this method is chosen, describe its Internet location and either detail its operation in this section, or refer to the supporting procedures that describes its operation.*

CM has the prime responsibility for managing, compiling, maintaining, and publishing the [[Project Title]] detailed CSA reports. These reports provide the status to management that all changes between the technical description and the product itself are being accounted for on a one-to-one relationship. This status information, together with the CSA reports maintained by the CM organization, is an input for the final review for product acceptance.

Project management determines the frequency of distribution and recipients of the CSA reports. These reports include the information listed below:

* Identification of currently approved configuration documentation and configuration identifiers associated with each CI.
* Status of proposed change requests from initiation to implementation.
* Results of configuration audits; status and disposition of discrepancies.
* Traceability of changes from baselined documentation of each CI.
* Effectiveness and installation status of configuration changes to all CIs at all locations.

The above reports answer basic questions regarding the approved configuration (baseline) and the implementation status of changes to the baseline, and define differences between successive baselines of a product.

## REQUESTS FOR CSA REPORTS

Requests for CSA reports originating outside the project are directed for approval to Project Management, which authorizes need-to-know access.

# CONFIGURATION AUDITS

***Guidance***

*This section describes the approach used in performing configuration audits.*

*Configuration audits validate that the design and the final product conform to approved functional requirements defined in specifications and drawings, and that the changes to the initially-approved specifications and drawings have been incorporated.*

CM assists in the conduct of two audits for developed baselines prior to their release: the FCA and PCA. These audits ensure that baseline changes are validated and the new baseline meets new requirements and specifications. These audits are conducted in accordance with [[the guiding standard]].

CM personnel provide assistance through the specific activities listed below, as required by the project.

* Review audit checklists
* Prepare CM reports, logs, or records required to support the audit
* Ensure maintenance of the baseline specification and product files
* Follow up on audit reports to assess possible CM impact
* Provide storage for audit documentation, records, and products
* Ensure that audit report action items are resolved.

## FUNCTIONAL CONFIGURATION AUDIT

CM ensures that the released version of the products is available for the audit so that the inspectors can verify that each configuration item performs as required by its allocated configuration.

FCAs are usually conducted before the establishment of the Product Baseline or after a major change or a significant number of minor changes have occurred. The CM Manager is responsible for assisting QA in the preparation of the FCA plan. The FCA plan identifies the specific tasks and procedures to accomplish those tasks. The FCA plan identifies the documents, hardware, software, test sets, etc. required for performing the audit. The CM Manager records differences between the ***SSS, SRS cite the appropriate project product specification(s)*** and the CI under audit for incorporation into the minutes of the FCA for post-audit action.

## PHYSICAL CONFIGURATION AUDIT

This audit ensures that the as-built configuration is accurately reflected by the released documentation to establish the Product Baseline. CM audits the released engineering documentation and quality control records to make sure the as built or as-coded configuration is reflected by this documentation.

PCAs are usually conducted concurrently with FCAs or immediately following an FCA. The CM Manager is responsible for assisting QA in the preparation of the PCA plan. The PCA plan identifies specific tasks and procedures to accomplish those tasks. The PCA plan also identifies the product, software and technical documentation to be examined.

## AUDITS AND REVIEWS OF CM

To ensure that CM efforts are adequate and completed as detailed in this document, audits and reviews of CM procedures and products are performed as described in the following paragraphs.

### **CM AUDITS**

To ensure that the CM program complies with the requirements specified in this plan, an independent audit of CM procedures, and products is required. Normally, a QA representative performs this type of audit. Products generated or tracked by CM are listed below:

* CSA reports
* Identified CIs
* Change requests
* System/Software version releases
* Libraries
* Documented CM procedures
* CM review reports.

The audit findings are documented in an audit report and provided to the CM Manager. The audit report is used by the CM Manager to correct deficiencies or identify changes in the CM requirements. Correcting deficiencies may include updating CM procedures, records, configuration documents, software, or tools. Identifying changes in the CM requirements would result in adding, modifying, or deleting a requirement in this CMP.

### **CM REVIEWS**

The CM Manager periodically obtains internal and external reviews of CM procedures and products. A CM review serves as a method to determine how effectively and efficiently the CM procedures fulfill the CM requirements as defined in this plan. CM reviews include internal and external verification of the products (processes and artifacts) generated by CM. Verification is the process of evaluating the products to ensure correctness and consistency with respect to the CMP, tasks, CM Process, and procedures. The review findings are documented in a report that is provided to the Project Manager, and used by the CM Manager to correct deficiencies or identify changes in CM requirements.

It is the CM Manager's responsibility to perform or assign CM personnel to perform the internal CM reviews, to request the objective external CM reviews, and to provide the CM procedures and artifacts to be reviewed. The review report includes what actions were taken to resolve the deficiency or requirements change. The review report is filed with the appropriate procedure and serves as a record to show that a CM review was performed and corrective action was taken, as required. QA or other objective evaluation group may further audit review reports, as appropriate.

***Guidance***

*If the project specifies QA participation in periodic CM Reviews, the process for conducting these reviews will be described in the appropriate project QA Plan and procedures, which should be referenced for further information.*

# SUBCONTRACTOR/VENDOR CONTROL

This section describes the methods used to ensure subcontractor/vendor compliance with configuration management requirements.

***Guidance***

*If the project contractor operates as a peer member of an Integrated Product Team providing CM support, or otherwise chooses to be bound by the project CM Plan, then a separate subcontractor CM Plan is not required.*

Each contractor working on this system is required to develop a configuration management plan that is in conformance to this document. The development contractor ensures that non-deliverable components or software will functionally meet the requirements of the system.

Configuration management personnel are acquired as a team through competitive contract negotiation. The CM staff has responsibility for conducting the CM function under the management of name of the supervising organization or function assigned by the program. The staff is required to be fully- knowledgeable in all aspects of the program's configuration management function and to maintain and upgrade the CM program whenever they can.

# REVIEW OF CM ACTIVITIES WITH HIGHER-LEVEL MANAGEMENT

This section describes the requirement for periodic review of CM activities with higher-level management and describes the process for conducting periodic reviews of all project activity. CM activities will be reviewed during name of project review. Agenda for these reviews will include the items listed below:

* CM scheduled activities
* CM performance metrics
* Review of planned versus actual CM tasking
* Outstanding issues.

***Guidance***

*This is a nominal agenda for reviewing CM activities. The project CM Manager, collaborating with the Project Manager, should establish and document, the appropriate agenda items for review during these meetings. The process for these meetings should also establish required attendees from higher-level management, and any reports or action items that are documented to facilitate managing CM activities.*

# COLLECTING IMPROVEMENT INFORMATION

***Guidance***

*This section describes the requirements for collecting, assessing, reporting, and acting upon measures of activities and work products derived from planning and performing the CM Process to support the future use and improvement of the project and the organization’s CM Process and process assets.*

The CM group, working with the project manager, defines measures of CM activity, which includes the measures listed below:

***Guidance***

*Cite the project database from which these measures are derived, usually the project’s CSA report.*

* Number of existing proposed change requests (including status, priority, age).
* Number of existing trouble reports (including status, priority, age).
* Planned versus actual CM labor expenditures.
* Outstanding CM issues.
* Proposed new or revised CM procedures.
* Periodic objective review of CM activities (reporting identified process defects and resolution, and recommended process improvements).

***Guidance***

*These are nominal proposed CM performance measures. The CM Group uses this section to identify the specific performance measures that will be collected and evaluated by the group and the Project Manager to facilitate the management and improvement of the CM function.*

On a periodic basis, the CM group reports these measures to the Project Manager. The Project Manager uses these measures as the basis for reviewing CM activities effectiveness, and for proposing new or revised CM procedures. These metrics are also reported in the periodic review of project activities conducted.

# APPENDIX A: ACRONYMS, ABBREVIATIONS AND DEFINITIONS

## ACRONYMS AND ABBREVIATIONS

|  |  |
| --- | --- |
| ABL | Allocated Baseline |
| ACD | Allocated Configuration Documentation |
| AM | Acquisition Manager |
| ANSI | American National Standards Institute |
| CAD | Computer-Aided Design |
| CAM | Computer-Aided Manufacturing |
| CCB | Configuration Control Board |
| CDRL | Contract Data Requirements List |
| CI | Configuration Item |
| CMMI | Capability Maturity Model, Integrated |
| CM | Configuration Management |
| CMP | Configuration Management Plan |
| CMS | Configuration Management System |
| CMU | Carnegie Mellon University |
| COM | Computer Operation Manual |
| COTS | Commercial Off-The-Shelf |
| CRB | Change Review Board |
| CSA | Configuration Status Accounting |
| DBDD | Database Design Description |
| DID | Data Item Description |
| DM | Data Management |
| DoD | Department of Defense |
| DWG | Drawing |
| ECP | Engineering Change Proposal |
| EIA | Electronic Industries Association or Alliance |
| FBL | Functional Baseline |
| FCA | Functional Configuration Audit |
| FCD | Functional Configuration Documentation |
| FPC | Functional and Physical Characteristics |
| FW | Firmware |
| HW | Hardware |
| HWCI | Hardware Configuration Item |
| ICD | Interface Control Document |
| ICWG | Interface Control Working Group |
| ID | Identification |
| IDD | Interface Design Document |
| IEC | International Electrotechnical Commission |
| IEEE | Institute of Electrical and Electronics Engineers |
| IRS | Interface Requirements Specification |
| ISO | International Organization for Standardization |
| LCCB | Local Configuration Control Board |
| MIL | Military |
| NAVAIR | Naval Air Systems |
| NDS | Non-Developmental Software |
| NOR | Notice of Revision |
| OCD | Operational Concept Description |
| OJT | On-the-Job Training |
| OT&E | Operational Testing and Evaluation |
| PAL | Process Asset Library |
| PBL | Product Baseline |
| PCA | Physical Configuration Audit |
| PCD | Product Configuration Documentation |
| PMCC | Project Management Core Course |
| PMP | Project Management Plan |
| QA | Quality Assurance |
| SCN | Specification Change Notice |
| SCOM | Systems/Software Center Operator Manual |
| SCP | Software Change Proposal |
| SCR | Software Change Request ***or System/Software Change Request*** |
| SDD | Software Design Document |
| SDF | Software Development File |
| SDL | Software Development Library |
| SDP | Software Development Plan |
| SEI | Software Engineering Institute |
| SEP | Software Enhancement Proposal |
| SEPO | Systems Engineering Process Office |
| SIOM | Software Input/Output Manual |
| SPAWAR | Space and Naval Warfare (Command) |
| SPI | Systems/Software Process Improvement |
| SPS | Software Product Specification |
| SRS | Software Requirements Specification |
| SSA | Software Support Activity |
| SSC | SPAWAR Systems Center |
| SSDD | System/Subsystem Design Document |
| SSS | System/Subsystem Specification |
| STD | Standard; also, Software Test Description |
| STR | Software Test Report |
| SUM | Software User Manual |
| SVD | Software Version Description |
| TR | Trouble Report |
| TRR | Test Readiness Review |
| V&V | Verification and Validation |
| WS | WorkStation |

## DEFINITION OF TERMS

***Guidance***

*The author may elect to move the acronyms and abbreviations now contained in Appendix A to a separate numbered section in Section 1, if the list is considered brief enough.*

*Identify project-specific forms and terms that will be used for the following:*

* + *Correct errors in performance requirements, design, coding, or documentation*
  + *Change in user requirements*
  + *Change system hardware*
  + *Change in associated or interfacing systems*
  + *Correct hardware deficiencies*
  + *Change in technology*

*For each form used, create a separate definition and place alphabetically in the appropriate paragraphs below. The terms and definitions below may be used or replaced with terms and definitions more appropriate to the project CM activities and forms.*

* **ALLOCATED BASELINE (ABL)** - The approved allocated configuration documentation.
* **ALLOCATED CONFIGURATION DOCUMENTATION (ACD)** - The documentation describing a CI’s functional, performance, interoperability, and interface requirements that are allocated from those of a system or higher level configuration item; interface requirements with interfacing configuration items; and the verifications required to confirm the achievement of those specified requirements.
* **AS-BUILT** -Defines the initial software, hardware, or system configuration as it actually has been built.
* **AUDIT** -An independent examination of a work product or set of work products to determine whether requirements are being met.
* **BASELINE** - (1) An agreed-to description of the attributes of a product, at a point in time, which serves as a basis for defining change. (2) An approved and released document, or a set of documents, each of a specific version; the purpose of which is to provide a defined basis for managing change. (3) The currently approved and released configuration documentation. (4) A released set of files comprising a software version and associated configuration documentation.
* **COMPUTER SOFTWARE (or SOFTWARE)** - A combination of associated computer instructions and computer data definitions required to enable the computer hardware to perform computational or control functions.
* **CONFIGURATION** - (1) The performance, functional, and physical attributes of an existing or planned product, or a combination of products. (2) One of a series of sequentially created variations of a product.
* **CONFIGURATION AUDIT** - Product configuration verification accomplished by inspecting documents, products and records; and reviewing procedures, processes, and systems of operation to verify that the product has achieved its required attributes (performance requirements and functional constraints) and that the product’s design is accurately documented. Sometimes divided into separate functional and physical configuration audits.
* **CONFIGURATION CONTROL** - (1) A systematic process which ensures that changes to released configuration documentation are properly identified, documented, evaluated for impact, approved by an appropriate level of authority, incorporated, and verified. (2) The configuration management activity concerning: the systematic proposal, justification, evaluation, coordination, and disposition of proposed changes; and the implementation of all approved and released changes into (a) the applicable configurations of a product, (b) associated product information, and (c) supporting and interfacing products and their associated product information.
* **CONFIGURATION IDENTIFICATION** - The selection of CIs; the determination of the types of configuration documentation required for each CI; the issuance of numbers and other identifiers affixed to the CIs and to the technical documentation that defines the CIs configuration, including internal and external interfaces; the release of CIs and their associated configuration documentation; and the establishment of configuration baselines for CIs.
* **CONFIGURATION ITEM** **(CI)** - An aggregation of work products that satisfies an end use function and is designated by the Government for separate configuration management; also defined as Computer Software Configuration Item (CSCI) and Hardware Configuration Item
* **CONFIGURATION MANAGEMENT (CM)** - A discipline that applies technical and administrative direction and surveillance to perform the functions listed below:
  + Identifying the configuration of selected work products that compose the baselines at given points in time.
  + Controlling changes to configuration items.
  + Building or providing specifications to build work products from the configuration management system.
  + Maintaining the integrity of baselines.
  + Providing accurate status and current configuration data to developers, end users, and customers
* **CONFIGURATION STATUS ACCOUNTING (CSA)** - The recording and reporting of information needed to manage configuration items (CI) effectively, including:
  + A record of the approved configuration documentation and identification numbers
  + The status of proposed changes, deviations to the configuration
  + The implementation status of approved changes
  + The configuration of all units of the CI in the operational inventory
* **DELIVERABLE** - A system or component that is obligated contractually to a customer or intended user.
* **DEVELOPMENTAL CONFIGURATION** - The work products and associated technical documentation that define the evolving configuration of a CI during development. It is under the development contractor's or Government organization's configuration control and describes the product design and implementation. The Developmental Configuration may be stored on electronic media
* **DEVIATION** -A specific written authorization to depart from a particular requirement(s) of an item's current approved configuration documentation for a specific number of units or a specified period of time, and to accept an item which is found to depart from specified requirements, but nevertheless is considered suitable for use "as is" or after repair by an approved method. (A deviation differs from an engineering change in that an approved engineering change requires corresponding revision of the item's current approved configuration documentation, whereas a deviation does not.)
* **ENGINEERING CHANGE PROPOSAL (ECP)** - A proposed engineering change and the documentation by which the change is described, justified, and submitted to the Government for approval or disapproval
* **ENGINEERING NOTEBOOK -** The collected requirements, specifications, technical approach, design, engineering, and testing of the product. Engineering Notebooks shall include minutes of technical working groups, meetings, issues, risks, and action items relating to the accomplishment of the technical tasks relating to the development of the product.
* **FIRMWARE** - The combination of a hardware device and computer instructions or computer data that reside as read-only software on the hardware device. The software cannot be readily modified under program control
* **FUNCTIONAL BASELINE (FBL)** – The approved functional configuration documentation.
* **FUNCTIONAL CONFIGURATION AUDIT (FCA)** - The formal examination of functional characteristics of a CI, prior to acceptance, to verify that the CI has achieved the requirements specified in its functional and allocated configuration documentation
* **FUNCTIONAL CONFIGURATION DOCUMENTATION (FCD)** - The documentation describing the system’s functional, performance, interoperability, and interface requirements and the verifications required to demonstrate the achievement of those specified requirements.
* **HARDWARE (HW) -** Products made of material and their components (mechanical, electrical, electronic, hydraulic, pneumatic). Computer software and technical documentation are excluded.
* **NONDEVELOPMENTAL SOFTWARE (NDS)** - Deliverable software that is not developed under the contract but is provided by the contractor, the Government, or a third party. NDS may be referred to as reusable software, Government-furnished software, or commercially available software, depending on its source. NDS may include commercial off the shelf (COTS) and/or government off the shelf (GOTS) products.
* **NOTICE OF REVISION (NOR)** - A document used to define revisions to drawings, associated lists, or other referenced documents that require revision after ECP approval. [MIL-HDBK-61A] Table 6-10 provides the format and preparation instructions for a NOR.
* **PRODUCT BASELINE (PBL)** - The approved product configuration documentation.
* **PHYSICAL CONFIGURATION AUDIT (PCA)** - The formal examination of the "as-built" configuration of a CI against its technical documentation to establish or verify the CI's product baseline.
* **PHYSICAL CONFIGURATION DOCUMENTATION (PCD) -** A CI’s detail design documentation including those verifications necessary for accepting product deliveries (first article and acceptance inspections.) Based on program production/procurement strategies, the design information contained in the PCD can be as simple as identifying a specific part number or as complex as a full design disclosure.
* **PROJECT GROUP** - Project members responsible for the requirements, design, development, validation, verification, documentation, maintenance, and logistics of systems and software.
* **PROGRAM MANAGEMENT** - The Government organization sponsoring the field activity project office.
* **PROJECT MANAGEMENT** - The designated Government organization from the field activity project office responsible for the overall management of specific projects.

***Guidance***

*Define local project management office.*

* **RELEASE** - A configuration management action whereby a particular version of software is made available for a specific purpose (e.g., released to test).
* **REUSABLE SOFTWARE** - Software developed in response to the requirements for one application that can be used, in whole or in part, to satisfy the requirements for another application
* **RESOURCES** - The totality of hardware, facilities, tools, computer software, personnel, documentation, supplies, and services applied to a given effort.
* **SOFTWARE** - See **Computer Software**.

**Guidance**

The SDL includes the Developmental Configuration as part of its contents. The SDL provides storage of and controlled access to development products in human-readable form, machine-readable form, or both. This library may also contain management data pertinent to the development project.

* **SOFTWARE DEVELOPMENT LIBRARY (SDL)** - A controlled collection of engineering documentation, software, and other intermediate and final product development elements, and associated tools and procedures used to facilitate the orderly development and subsequent support of the product. [MIL-STD-498]

***Guidance***

*The term “SCR” has been used to define a Software Change Request, but may also be used to define a System/Software Change Request to denote changes to Systems and/or Hardware CIs.*

* **SOFTWARE** **CHANGE REQUEST (SCR) FORM** - A vehicle used to report deficiencies or enhancements generated against CIs or technical data; a document that requests a correction or change to the baseline documentation and software.
* **SYSTEM SUPPORT** - The sum of all activities that take place to ensure that implemented and fielded system and/or software continues to fully support the operational mission of the system.
* **SOFTWARE UNIT** - An element in the design of a software item; for example, a major subdivision of a software item, a component of that subdivision, a class, object, module, function, routine, or database. Software units may occur at different levels of a hierarchy and may consist of other software units. Software units in the design may or may not have a one-to-one relationship with the code and data entities (routines, procedures, databases, data files, etc.) that implement them or with the computer files containing those entities.
* **SYSTEM TEST ENVIRONMENT** - A set of automated tools, firmware devices, and hardware necessary to test systems. The automated tools may include but are not limited to test tools such as hardware/communication protocol emulators, simulation software, code analyzers, test case generators, path analyzers, etc. and may also include the tools used in the systems engineering environment.
* **SPECIFICATION CHANGE NOTICE (SCN)** - A document used to propose, transmit, and record changes to a specification. [MIL-STD-973] Appendix Fprovides the format and preparation instructions for an SCN.

***Guidance***

*This term is also used to describe a category of Peer Review. Ensure that this term is defined in accordance with the organization Peer Review process, PR-PR-02, SSC San Diego.*

* **TECHNICAL REVIEW** - An activity by which the technical progress of a project is assessed relative to its technical or contractual requirements. The review is conducted at logical transition points in the development effort to identify and correct problems resulting from the work completed thus far before the problems can disrupt or delay the technical progress. The review provides a method for the contractor and Government to determine that development of a CI and its documentation have met contract requirements.
* **VERSION** - An identified and documented body of a system or subset. Modifications to a version of a system (resulting in a new version) require configuration management actions, by either the contractor, the Government, or both.
* **AIVER** - See “Deviation”

# APPENDIX B: FORMS

This appendix includes the format of the change request form as shown in Figure B-1.

***Guidance***

*The author may include the project-specific change request form as Figure B-1. Insert the form here.*

***Guidance***

*The forms included on the next pages of this section are illustrations of the "System or Software Change/System or Software Enhancement Proposal" and the "System or Software Trouble Report/Change Request (STR/SCR)" that may be used by the project. This section should include only the forms used by the project. The author can refer to Configuration Management, MIL-STD-973 for the standard forms, but they will not be included in this section.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. SYSTEM/PROJECT NAME | 2. DATE PREPARED | | | 3. SCP NUMBER |
| 4. TITLE OF SCP | | | | |
| 5. ORIGINATOR | | 6. COMPONENT AFFECTED | | |
| 7. DESCRIPTION OF PROBLEM/NEED FOR SCP | | | | |
| 8. DESCRIPTION OF RECOMMENDED SCP | | | | |
| 9. ALTERNATIVES/IMPACT IF NOT APPROVED | | | | |
| 10. BASELINE AFFECTED | 11. DOCUMENTATION/SPECIFICATIONS AFFECTED | | | |
| 12. OTHER SYSTEMS, CONFIGURATION ITEMS, CONTRACTORS AFFECTED, ETC. | | | | |
| 13. EFFECT OF SCP ON SYSTEM EMPLOYMENT, ILS, TRAINING, EFFECTIVENESS, ETC. | | | | |
| 14. NET EFFECT ON SYSTEM RESOURCES (E.G., PROCESSING TIME, MEMORY, DISK SPACE) | | | | |
| 15. DEVELOPMENTAL REQUIREMENTS | | | | |
| 16. SCP EFFECTIVITY POINT | | | 17. DATE APPROVAL NEEDED BY | |
| 18. THIS SCP MUST BE ACCOMPLISHED BEFORE/WITH/AFTER THE FOLLOWING ECP/SCP/SEP/STR(S) | | | | |
| 19. SUPERSEDES OR REPLACES ECP/SCP/SEP/STR | | | | |
| 20. COST, SCHEDULE OR INTERFACE IMPACT   NO YES (See attached DD Form 1692 ECP)  NO | | | | |
| 21. CONTRACTOR CCB ACTION   Approve  Disapprove  ECP | | | | |
| AUTHORIZED SIGNATURE | TITLE | | | DATE |
| 22. GOVERNMENT CCB ACTION   No Action Required  Approve  Disapprove  Withdrawn | | | | |
| RETURNED TO CONTRACTOR FOR | | | | |
| GOVERNMENT AGENCY/TITLE | SIGNATURE | | | DATE |

**Figure B-2. System/Software Change/Software Enhancement Proposal**

|  |  |  |
| --- | --- | --- |
| 1. NAME | | 2. DATE |
| 3. ORGANIZATION | | |
| 4. PHONE COM DA | | |
| 5. REPORT TYPE   SYSTEM/SOFTWARE TROUBLE REPORT   SYSTEM/SOFTWARE CHANGE REQUEST | 6. SYSTEM(S) and/or HARDWARE AFFECTED | 7. COMPUTER PROGRAM IDs |
| 8. BRIEF UNCLASSIFIED TITLE | | |
| 9. DETAILED NARRATIVE DESCRIPTION OF SYSTEM/SOFTWARE TROUBLE EXISTING (AND STATUS OF DISPLAYS AND CONTROLS) OR ENHANCEMENT DESIRED. INCLUDE A STATEMENT REGARDING IMPACT TO MISSION CAPABILITY. | | |

**Figure B-3. System/Software Trouble/Change Request (STR/SCR)**

# APPENDIX C: SCHEDULE OF PROJECT CM ACTIVITIES

*Insert schedule of Project CM activities here*

**Figure C-1: DOCUMENT CHANGE REQUEST (DCR)**

|  |  |
| --- | --- |
| Document Title: **CM Plan for** **[[Project Title]]** | Tracking Number: |
| Name of Submitting Organization: | |
| Organization Contact: | Phone: |
| Mailing Address: | |
| DCR Description: | Date: |
| Change Location:  (use section #, figure #, table #, etc.) | |
| Proposed change: | |
| Rational for Change: | |
| DCR Form 12/2013 | |